

Robert H. Gertner

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EDUCATION

Massachusetts Institute of Technology, Ph.D., September, 1986. Thesis Title: "Essays in Theoretical Industrial Organization."

Princeton University, A.B., summa cum laude, June, 1981, major in Economics.

EMPLOYMENT

Professor of Economics and Strategy, Graduate School of Business, The University of Chicago, September 1995 - present.

Research Fellow, National Bureau of Economic Research, October 1994 - present.

Associate Professor of Economics and Strategy, Graduate School of Business, The University of Chicago, April 1995 - August 1995.

Associate Professor of Business Economics, Graduate School of Business, The University of Chicago, September 1990 - April 1995.

Visiting Associate Professor of Management and Strategy, J. L. Kellogg Graduate School of Management, Northwestern University, September 1994 - March 1995.

Assistant Professor of Business Economics, Graduate School of Business, The University of Chicago, September 1986 - August 1990.

Full-time Consultant, American Telephone and Telegraph Company, Microeconomic Analysis Group, September 1981 - July 1982.

OTHER POSITIONS

Editor, *Journal of Business*, July 1995 - present.

Associate Editor, *Journal of Industrial Economics*, August 1995 - present.

FELLOWSHIPS AND GRANTS

John M. Olin Visiting Fellow in Law and Economics, The Law School, University of Chicago, 1990 - 1991.

IBM Corporation Scholar, University of Chicago, Graduate School of Business 1989 - 1990.

National Science Foundation Research Grant, "Bankruptcy and the Costs of Financial Distress," 1989 - 1991.

Visiting Scholar, CEPREMAP, Paris, France, April 1988.

Alfred P. Sloan Foundation Doctoral Dissertation Fellowship, 1985 - 1986.

National Science Foundation Graduate Fellowship, 1982 - 1985.

ACADEMIC PUBLICATIONS

BOOK:

Game Theory and the Law, (with Douglas Baird and Randal Picker), Harvard University Press, November 1994.

PUBLISHED AND FORTHCOMING PAPERS

"Agreement Under Section 1 of the Sherman Act," (with Andrew Rosenfield), November, 1997 (*forthcoming The New Palgrave Dictionary of Economics and the Law*).

"Unravelling and Disclosure Laws," August 1997 (*forthcoming The New Palgrave Dictionary of Economics and the Law*).

"Communication Among Competitors: Game Theory and Antitrust," (with Dennis Carlton and Andrew Rosenfield), Spring, 1997 *George Mason Law Review*, vol. 5.

"Multimarket Contact and Tacit Collusion with Imperfect Monitoring," (with Barbara

McCutcheon), December, 1992, revised, September, 1993, (under review, *Rand Journal of Economics*).

- "Settlement Escrows," (with Geoffrey Miller), *Journal of Legal Studies*, 24 January, 1995, 87-122.
- "Internal versus External Capital Markets," (with David S. Scharfstein and Jeremy C. Stein), *Quarterly Journal of Economics*, 109, November, 1994, 1211-1230.
- "Anatomy of Financial Distress: An Examination of Junk-Bond Issuers," (with Paul Asquith and David Scharfstein), *Quarterly Journal of Economics*, 109, August 1994, 625-658.
- "Asymmetric Information, Uncertainty, and Selection Bias In Litigation," 1993, *The University of Chicago Law School Roundtable*, Vol. 1993 (inaugural edition), 75-94.
- "Game Shows and Economic Behavior: Risk Taking on 'Card Sharks'," *Quarterly Journal of Economics*, 108, May, 1993, 507-521.
- "Search With Learning from Prices: Does Increased Inflationary Uncertainty Lead to Higher Markups?" (with Roland Benabou), *Review of Economic Studies*, 60, January, 1993, 69-94.
- "Strategic Contractual Inefficiency and the Optimal Choice of Legal Rules," (with Ian Ayres), 101, *Yale Law Journal*, January, 1992, 729-773.
- "A Theory of Workouts and the Effects of Reorganization Law," (with David Scharfstein, *Journal of Finance*, 46, September, 1991, 1189-1221.
- "Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules," (with Ian Ayres), *Yale Law Journal*, 99, November, 1989, 87-130. Excerpts appear in, Richard Craswell and Alan Schwartz, editors, *Foundations of Contract Law*, Oxford University Press, 1994.
- "Market Power and Mergers in Durable Goods Industries," (with Dennis Carlton), *Journal of Law and Economics*, 32, October 1989, S203-S226.
- "Simultaneous Signaling to the Capital and Product Markets," (with Robert Gibbons and David Scharfstein, *Rand Journal of Economics*, 19, Summer 1988, 173-190.

WORKING PAPERS

- "Tacit Collusion with Immediate Responses: The Role of Asymmetries," April, 1993, revised, December, 1994 (under review, *Journal of Political Economy*).
- "Internal Capital Markets: The Enforcement and Efficiency of Exclusive Capital Supply Contracts," December, 1994, formerly, "The Organization of Capital Market Transactions: Exclusive Contracts and Vertical Integration Under Asymmetric Information," June, 1986.
- "Externalities, Delay, and Coalition Formation in Multilateral Bargaining," August, 1994, originally titled, "Inefficiency in Three-Person Bargaining," June 1989.

"Bankruptcy, Information Transmission and the Allocation of Control," (with Randal Picker), February, 1992, revised, April, 1994.

"Capital Structure Signalling in Distressed Debt Workouts," November 1990, revised, September, 1993.

"Internal Capital Markets," March, 1995.

"Revenue and Efficiency Differences Between Sequential and Simultaneous Auctions with Limited Information," October, 1995.

"Coordination, Dispute Resolution, and the Scope of the Firm," April, 1996.

"Price Fixing Under the Sherman Act: The New Learning from Game Theory," with Andrew Rosenfield), May, 1996.

"The Value-Maximizing Board," (with Steven Kaplan), December, 1996.

CASE STUDIES

"The Feature Animation Industry in 1995: Challenging Disney's Supremacy," (with Stacey Roth), March, 1995, revised, September, 1995.

"Selling the Radio Spectrum: The 30 MHz MTA PCS Auction," April 1995.

TEACHING EXPERIENCE

Microeconomics (M.B.A.)

Applied Microeconomics (M.B.A./Ph.D.)

Industrial Organization (Ph.D.)

Financial Markets and Institutions (M.B.A.)

Competitive Strategy (M.B.A.)

Corporation Law (J.D.)

Business Policy (M.B.A.)

Management of Organizations (M.B.A. Kellogg)

Seminar on Advanced Antitrust (J.D.)

Advanced Competitive Strategy: Game Theory in Practice (M.B.A.)

ADDITIONAL EXPERIENCE

Analysis of antitrust and strategic issues in mergers, joint ventures, and monopolization litigation with Lexecon Inc.

Consultant of a variety of strategic management issues including incentive compensation, supplier relationships, and acquisitions.

Auction design and bidding adviser to WirelessCo. (joint venture of Sprint, TCI, Cox Cable, and Comcast) and AirLink L.L.C. in FCC spectrum auctions.

Lost profit and valuation analysis in corporate litigation.

Testimony before the Federal Trade Commission on Consumer Protection and Antitrust in Cyberspace.

CASES IN WHICH I PROVIDED DEPOSITIONS OR TRIAL TESTIMONY:

Stratosphere Corporation, and Stratosphere Gaming Corp., United States Bankruptcy Court, District of Nevada, CN BK-S 97-20554-GWZ and BK-S 97-20555-GWZ, Deposition and trial testimony, in a case where the central economic issue was the structure of a credit enhancement to a loan agreement, February 1998.

Trio Holdings et. al. v. Columbus Investment et. al. Cook County Circuit Court, Deposition and trial testimony on economic incentives in partnership and damages from self-dealing, for defendant, November 1997.

Ellen Steffen et. al. v. Playmobil USA, Inc., United States District Court, Eastern District of New York, CV 95 2896, CV 96 3937, CV 96 3938, Deposition on economic issues in a vertical price fixing case, for defendant, May, 1997.

Hi-Lite Products v. American Home Products, United States District Court, Northern District of Illinois, Case 92 C 0384, Deposition and trial testimony on damages a contract breach case, for plaintiff, January 1996.



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EDUCATION

B.S., CORNELL UNIVERSITY, Electrical Engineering (with honors), 1966
M.S., CORNELL UNIVERSITY, Electrical Engineering, 1967
M.A., STANFORD UNIVERSITY, Economics, 1975
Ph.D., STANFORD UNIVERSITY, Engineering-Economic Systems, 1976

PRESENT POSITIONS

LECG
Principal
Member, Board of Directors

UNIVERSITY OF CALIFORNIA, BERKELEY, 1983- present
Professor of Economics

UNIVERSITY OF CALIFORNIA, BERKELEY, 1997-present
Adjunct Professor of Business Administration

PROFESSIONAL EXPERIENCE

U.S. DEPARTMENT OF JUSTICE, Antitrust Division, 1993-1995
Deputy Assistant Attorney General for Economics

UNIVERSITY OF CALIFORNIA, BERKELEY, 1990-1993
Adjunct Professor of Business Administration

UNIVERSITY OF CALIFORNIA ENERGY INSTITUTE, 1984-1993
Director

STANFORD UNIVERSITY, 1982-1983
Associate Professor of Engineering-Economic Systems (with tenure)

UNIVERSITY OF CALIFORNIA, BERKELEY, 1979-1983
Associate Professor of Economics (with tenure)

UNIVERSITY OF CALIFORNIA, BERKELEY, 1976-1979
Assistant Professor of Economics

STANFORD UNIVERSITY, 1975-1976
Research Associate, Department of Economics and Institute for Energy Studies

U.S. NAVY, 1967-1971
Lieutenant, Senior Grade

FELLOWSHIPS AND AWARDS

Visiting Fellow, Churchill College, University of Cambridge, 1979

Visiting Fellow, Nuffield College, University of Oxford, 1979

Fulbright Scholar, South America, 1989

Recipient of the 1st Annual Berkeley Center for Law and Technology Award for Contributions to the Development of Law and Public Policy, 1996

Listed in *Who's Who*

PROFESSIONAL ACTIVITIES

President, *Industrial Organization Society*, 1994-1995

Associate Editor, *Journal of Economic Theory*, 1983-1989

Associate Editor, *Journal of Industrial Economics*, 1990-1993

Associate Editor, *Review of Industrial Organization*, 1990-1993

Vice-Chair, American Bar Association Antitrust Economics Committee, 1993-1995

Co-Director, Program on Workable Energy Regulation, 1990-1993

Review Panel, National Science Foundation, Economics Program, 1985

Review Panel, National Science Foundation, Regulation Program, 1985-1986

Advisor to U.S. Department of Energy, Energy Assessment Panel on Energy Security, 1992

Member of Advisory Board, California Institute for Energy Efficiency, 1992-3

Member of the Advisory Board, Center for Research in Management, University of California at Berkeley, 1998-present
Conference Organizer: European Summer Symposium in Economic Theory, Gerzensee, 1998; Post-Chicago Economics Conference, Washington, D.C., May 26-27, 1994; International Comparisons of Electricity Regulation, Toulouse, May 1993; Economics of Energy Conservation, Berkeley, June 1992; Telecommunications Policy Research Conference, 1988, 1989; Developments in Electricity Regulation, Berkeley, June 1987

Session Organizer: 1994 Meetings of the American Economic Association; 1987 Meetings of the Econometrics Society; 1984 Meetings of the American Economic Association; 1983 Meetings of ORSA/TIMS Associations.

Referee for: *American Economic Review*, *Econometrica*, *International Economic Review*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Rand Journal*, *Review of Economic Studies*. Occasional referee for other journals

Member of American Economic Association, Econometric Society, Sigma Xi, Tau Beta Pi, Eta Kappa Nu.

Associate Member, American Bar Association, Antitrust Section

PUBLICATIONS

Articles

- 1) "Antitrust Policy for the Licensing of Intellectual Property: An International Comparison," forthcoming in the *International Journal of Technology Management*.
- 2) "Competition Policy," with Oliver Williamson, *The New Palgrave Dictionary of Law and Economics*. Macmillan, 1998.
- 3) "Antitrust Issues in the Licensing of Intellectual Property: The Nine No-No's Meet the Nineties," with Carl Shapiro, *Brookings Papers: Microeconomics*, 1997, pp. 283-336.
- 4) "Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?" with Severin Borenstein and A. Colin Cameron, *Quarterly Journal of Economics*, vol. 112, Issue 1, February 1997, pp. 305-339.
- 5) "An Economic Analysis of Unilateral Refusals to License Intellectual Property," with Carl Shapiro, *Proceedings of the National Academy of Sciences of the United States of America*, vol. 93, no. 23, November 12, 1996, pp. 12749-12755.
- 6) "The Use of Innovation Markets: A Reply to Hay, Rapp and Hoerner," with Steven Sunshine, *Antitrust Law Journal*, vol. 64, no. 1, Fall 1995, pp. 75-82.

- 7) "Defining the Intersection of Intellectual Property and the Antitrust Laws: The 1995 Antitrust Guidelines for the Licensing of Intellectual Property," *Antitrust*, vol. 9, issue 3, Summer, 1995.
- 8) "Regulating Complementary Products: A Comparative Institutional Analysis," with Michael Riordan, *Rand Journal of Economics*, vol. 26, no. 2, Summer, 1995, pp. 243-256.
- 9) "Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets," with Steven Sunshine, *Antitrust Law Journal*, vol. 63, no. 2, Winter 1995, pp. 569-602. Reprinted in Andrew I. Gavil (ed.), *An Antitrust Anthology*, Anderson Publishing, 1996.
- 10) "The Dynamic Efficiency of Regulatory Constitutions," with David Newbery, *Rand Journal of Economics*, vol. 25, no. 4, Winter, 1994, pp. 538-554.
- 11) "A Review and Analysis of Utility Conservation Incentive Programs," with Steven Stoff, *The Yale Journal on Regulation*, Winter, 1994, pp. 1-42.
- 12) "Coordination in the Wholesale Market: Where does it Work?" with Edward Kahn and Matthew White, *The Electricity Journal*, vol. 6, no. 8, October 1993, pp. 51-59.
- 13) "Uncle Sam at the Gas Pump: The Causes and Consequences of Gasoline Distribution Regulations," *Regulation*, vol. 16, no. 2, 1993, pp. 63-75.
- 14) "Product Line Rivalry with Brand Differentiation," with Carmen Matutes, *The Journal of Industrial Economics*, September, 1993, pp. 223-240.
- 15) "Alternative Entry Paths: The Build or Buy Decision," with David Newbery, *Journal of Economics, Management, and Strategy*, Spring, 1992, pp. 129-150.
- 16) "Introduction to Symposium on Compatibility: Incentives and Market Structure," *The Journal of Industrial Economics*, March 1992, pp. 1-8.
- 17) "Legal and Economic Issues in the Commercialization of New Technology," *Journal of Institutional and Theoretical Economics*, March 1991, pp. 155-181.
- 18) "Multiproduct Competition," with Carmen Matutes, *Annales d'Economie et de Statistique*, vol. 18, April/June 1990, pp. 151-163.
- 19) "Optimal Patent Length and Breadth," with C. Shapiro, *Rand Journal of Economics*, vol. 21, no. 1, Spring 1990, pp. 106-112.
- 20) "The Role of Potential Competition in Industrial Organization," *Journal of Economic Perspectives*, vol. 3, No. 3, Summer 1989, pp. 107-127. Reprinted in Bonanno, G. and D. Brandolini (eds.), *Industrial Structure in the New Industrial Economics*. Clarendon Press, Oxford, 1990, pp. 38-67.
- 21) "Investment and Coordination in Oligopolistic Industries," with M. Lieberman, *Rand Journal of Economics*, vol. 18, no. 1, Spring 1987, pp. 17-33.

- 22) "Comment on Levin, R., A. Klevorick, R. Nelson, and S. Winter, 'Appropriating the Returns from Industrial Research and Development,'" *Brookings Papers on Economic Activity*, vol. 3, 1987, pp. 821-824.
- 23) "Investing Under Regulatory Uncertainty: What to do When the Rules Change," with H. Chao and S. Peck, *Energy Systems and Policy*, vol. 9, no. 4, 1986, pp. 385-396.
- 24) "Efficient Pricing During Oil Supply Disruptions," with K. Mork, *Energy Journal*, vol. 7, no. 2, April 1986, pp. 51-68.
- 25) "Entry Deterrence and the Free Rider Problem," with X. Vives, *Review of Economic Studies*, vol. LIII(1), no. 172, January 1986, pp. 71-84.
- 26) "Competition with Lumpy Investment," with R. Harris, *Rand Journal of Economics*, vol. 15, no. 2, Summer 1984, pp. 197-212.
- 27) "Will Oil Markets Tighten Again? A Survey of Policies to Manage Possible Oil Supply Disruptions," with K. Mork, *Journal of Policy Modeling*, vol. 6, no. 1, 1984, pp. 111-142.
- 28) "Customer and Investor Evaluations of Power Technologies: Conflicts and Common Grounds," with H. Chao and S. Peck, *Public Utilities Fortnightly*, vol. 113, no. 9, April 26, 1984, pp. 36-41.
- 29) "Preemptive Patenting and the Persistence of Monopoly: Reply," with D. Newbery, *American Economic Review*, vol. 74, no. 1, March 1984, pp. 251-253.
- 30) "Uncertain Innovation and the Persistence of Monopoly: Comment," with D. Newbery, *American Economic Review*, vol. 74, no. 1, March 1984, pp. 238-242.
- 31) "Strategic Considerations in Invention and Innovation: The Case of Natural Resources," with P. Dasgupta and J. Stiglitz, *Econometrica*, vol. 51, no. 5, September 1983, pp. 1439-1448. Reprinted in Binmore, K. and P. Dasgupta (eds.), *Economic Organizations as Games*, Basil Blackwell.
- 32) "Preemption, Leapfrogging and Competition in Patent Races," with D. Fudenberg, J. Stiglitz, and J. Tirole, *European Economic Review*, vol. 22, no. 1, June 1983, pp. 3-32.
- 33) "Invention and Innovation Under Alternative Market Structures: The Case of Natural Resources," with P. Dasgupta and J. Stiglitz, *Review of Economic Studies*, vol. 49(4), no. 158, October 1982, pp. 567-582.
- 34) "Preemptive Patenting and the Persistence of Monopoly," with D. Newbery, *American Economic Review*, vol. 72, no. 2, June 1982, pp. 514-526.
- 35) "Investment Decisions with Economies of Scale and Learning," with R. Harris, *American Economic Review*, Papers and Proceedings, vol. 71, no. 2, May 1981, pp. 172-177.
- 36) "Reducing Uranium Resource Uncertainty: Is it Worth the Cost?" with R. Richels, *Resources and Energy*, vol. 3, 1981, pp. 13-37.

- 37) "Optimal Depletion of an Uncertain Stock," *Review of Economic Studies*, vol. 46, no. 142, January 1979, pp. 47-58.
- 38) "An Overview of the Economic Theory of Uncertainty and Its Implications for Energy Supply," with D. Newbery and J. Stiglitz, *Electric Power Research Institute Technical Report*, January 1978.
- 39) "Dominant Firm Pricing with Exhaustible Resources," *Bell Journal of Economics*, Autumn, vol. 9, no. 2, 1978, pp. 385-395.
- 40) "Factor Price Stabilization with Flexible Production," *Annals of Economic and Social Measurement*, vol. 5, no. 5, 1978, pp. 521-533.
- 41) "The Effects of Risk on Prices and Quantities of Energy Supplies," with J. Stiglitz, *Electric Power Research Institute Technical Report*, in four volumes, May 1978.
- 42) "Potential Competition and the Monopoly Price of an Exhaustible Resource," with S. Goldman, *Proceedings of the Lawrence Symposium on Systems and Decision Sciences*, October 1977, pp. 205-207; also published in *Journal of Economic Theory*, vol. 17, no. 2, April 1978, pp. 319-331.
- 43) "Resource Extraction with Differential Information," *American Economic Review, Papers and Proceedings*, February 1977, pp. 250-254.
- 44) "LSA Operation of Large Volume Bulk GaAs Samples," *IEEE Transactions on Electron Devices*, vol. Ed-14, no. 9, September 1967.

Books

- 1) *International Comparisons of Electricity Regulation*, with Edward Kahn, Cambridge University Press, 1996.
- 2) *The Environment of Oil*, Kluwer Academic Press, 1993.
- 3) *Regulatory Choices: A Perspective on Developments in Energy Policy*, University of California Press, 1991.
- 4) *Strategic Competition and Barriers to Entry*, with P. Geroski and A. Jacquemin, in series vol. 41: *Theory of the Firm and Industrial Organization*, Lesourne, J. and H. Sonnenschein (eds.), *Fundamentals of Pure and Applied Economics*, Harwood Academic Press, 1990.

Chapters in Books

- 1) "Networks, Standards, and the Use of Market Dominance: Microsoft (1995)," forthcoming in Kwoka, J. and L. White (eds.), *The Antitrust Revolution: The Role of Economics*, 3rd edition, Oxford University Press.

- 2) "Unilateral Refusals to License Intellectual Property and International Competition Policy," in E. Hope and P. Maeleng (eds.), *Competition and Trade Policies: Coherence or Conflict?*, Routledge Press, London, 1998.
- 3) "The Efficiency of Market Coordination: Evidence from Wholesale Electric Power Pools," with Edward Kahn and Matthew White, in W. Sichel and D.L. Alexander (eds.), *Networks, Infrastructure, and the New Task for Regulation*, The University of Michigan Press, Ann Arbor, 1996.
- 4) "On the Delegation of Pricing Authority in Shared ATM Networks," in M. Guerin-Calvert and S. Wildman (eds.), *Electronic Services Networks: A Business and Public Policy Challenge*, Greenwood, Praeger Publishers, New York, 1991.
- 5) "Mobility Barriers and the Value of Incumbency," Chapter 8 in Schmalensee, R. and R. Willig (eds.), *Handbook of Industrial Organization*, North-Holland, 1989.
- 6) "Forecasting Technology Adoption with an Application to Telecommunications Bypass," with Jeffrey Rohlfis, in de Fontenay, A., M.H. Shugard and D.S. Sibley (eds.), *Telecommunications Demand Modelling: An Integrated View*, North-Holland, Amsterdam, 1990, pp. 399-412.
- 7) "Preemptive Competition," in G. F. Mathewson and J. Stiglitz (eds.), *New Directions in the Analysis of Market Structure*, MIT Press, Cambridge; Macmillan Press, London, 1986.
- 8) "Coping with Major Oil Disruptions," in J. Plummer, editor, *Energy Vulnerability*, Ballinger Press, 1982.
- 9) "Patents, Sleeping Patents, and Entry Deterrence," in S. Salop, editor, *Strategy, Predation, and Antitrust Analysis*, Federal Trade Commission, 1981.
- 10) "The Social and Private Value of Exploration Information," in J. Ramsey, editor, *Symposium on the Economics of Exploration for Energy Resources*, Greenwich CT: JAI Press, 1981.
- 11) "Search Strategies and Private Incentives for Resource Exploration," in R. Pindyck, (ed.), *Advances in the Economics of Energy and Resources*, vol. 2, JAI Press, 1979, pp. 149-169.
- 12) "The Economic Common Sense of Controlling Nuclear Power Development," with M. Boskin, *The California Nuclear Initiative*, Institute for Energy Studies, Stanford University, 1976; also published in *California Energy: The Economic Factors*, Federal Reserve Bank of San Francisco, 1976.
- 13) "A 1.1 GHz Scanned Acoustic Microscope," in *Acoustical Holography*, vol. 4, Plenum Press, 1972.

Working Papers

- 1) "An Economic Model of Rationing," with Paul Klemperer, submitted to the *Rand Journal of Economics*.

INVITED LECTURES AND TESTIMONY (Since 1986)

"The Microsoft Case: Antitrust for the 21st Century?" San Diego Business Round Table, San Diego, CA, October 23, 1998.

"Exclusive Dealing and Antitrust Policy," Department of Economics, University of California at San Diego, San Diego, CA, October 22, 1998.

"Antitrust Policy for the Computer Industry," Microprocessor Forum, San Jose, CA, October 14, 1998.

"Incorporating Economic Principles in Intellectual Property Damages," conference on The Economic Analysis of Intellectual Property Damages, San Francisco, CA, October 2, 1998.

"Antitrust Issues in the Licensing of Intellectual Property," (paper presentation and roundtable discussion leader), European Summer Symposium in Economic Theory, Gerzensee, Switzerland, June 29-July 4, 1998.

"Antitrust Issues in the Licensing of Intellectual Property: Microsoft Meets Contract Theory," (paper presentation and roundtable discussion leader), Conference on Regulation and Competition in Network Industries, June 5-6, Barcelona, Spain.

"Antitrust in High Technology Markets," speech before the Peninsula Intellectual Property Law Association, Palo Alto, CA, March 24, 1998.

Session Moderator on the Current Regulatory Environment, Conference on Telecommunications Incentives to Invest in Advanced Infrastructure, University of California at Berkeley, March 20, 1998.

"Identifying Limits on Relations Among Rivals," presented at the Conference Board 1998 Antitrust Conference, New York, NY, March 5, 1998.

"The DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property," invited lecture, Boalt School of Law, University of California at Berkeley, February 4, 1998.

"Antitrust in High Technology Markets," speech before the Intellectual Property Institute, San Francisco, CA, January 26, 1998.

"Comments on the Antitrust Treatment of Joint Ventures," invited participant in Federal Trade Commission Roundtable on per se illegality and rule of reason analysis of joint ventures, Washington D.C., December 12, 1997.

"Standards for Evaluating Market Power in Electricity," California ISO Market Power and Monitoring Workshop, Oakland, CA, November 18, 1997.

"Antitrust Issues in the Licensing of Intellectual Property," invited lecture, Boalt School of Law, University of California at Berkeley, November 13, 1997.

"Antitrust Issues and the Licensing of Intellectual Property," Third Annual Berkeley-Stanford Conference in Industrial Organization, Berkeley, CA, October 18, 1997.

"The Microsoft Antitrust Wars," invited lecture, Public Policy School, University of California at Berkeley, October 14, 1997.

"Electricity Merger Analysis: Does the FERC Follow the Merger Guidelines?" IAEE Annual Conference, San Francisco, CA, September 8, 1997.

"Networks and Bottlenecks," conference on Bridging Digital Technologies and Regulatory Paradigms, University of California at Berkeley, June 27, 1997.

"Unilateral Effects Analysis: Vertical Competition Issues in Telecommunications," conference on Competition Policy in Communications Industries: New Antitrust Approaches, Washington, D.C., March 10-11, 1997.

"Can Electricity Markets Be Competitive?" conference on Market Power and Competition in Electricity, Washington, D.C., February 27-28, 1997.

"An Economic Analysis of Unilateral Refusals to License Intellectual Property," New York University School of Law, February 6, 1997.

"Competition Policy in the High-Tech, Global Marketplace," Meeting of the American Economics Association, New Orleans, January 5, 1997.

"The Role of the State Public Utilities Regulatory Commission in Competition Policy," remarks before the Staff Subcommittee for NARUC on Strategic Issues, San Francisco, November 18, 1996.

"Economic Issues Copyright Protection: the Lotus v. Borland Case," National Bureau of Economic Research Summer Institute, Cambridge, MA, July 23, 1996.

"Unilateral Refusals to License Intellectual Property and International Competition Policy," conference on "Competition Policies for an Integrated World Economy," Oslo, Norway, June 14, 1996.

"Applying the Merger Guidelines to Electricity Mergers," Conference of Public Utility Counsel, San Francisco, CA, May 17, 1996.

"The US DOJ/FTC Intellectual Property Guidelines," invited address at the conference on "Competition Policy, Intellectual Property Rights, and International Economic Integration," Ottawa, Canada, May 12, 1996.

"Competition Issues Related to Software Patents," Berkeley Roundtable on Software Innovation, Berkeley, CA, April 26, 1996.

Moderator, "Panel on *Image Technical Services v. Eastman Kodak*," San Francisco Bar Association, San Francisco, CA, April 26, 1996.

"Economic Perspectives on Compulsory Licensing of Intellectual Property," American Bar Association Spring Antitrust Meeting, March 27, 1996, Washington, D.C.

Panel Discussant, "The 1995 Guidelines for the Licensing of Intellectual Property," High Technology Section of the Santa Clara Bar Association, Santa Clara, CA, February 7, 1996.

"Microeconomic Analysis in Government Policy," American Economic Association Annual Meeting, San Francisco, CA, January 5, 1996.

"Analysis of Market Power in the Computer Industry," Chinese Government Official Training Program, Biltmore Hotel, Santa Clara, CA, December 8, 1995.

"Antitrust Evaluation of Electric Utility Mergers," The Third DOE-NARUC National Electricity Forum, Washington, D.C., December 5, 1995.

"Responding to Structural Change: A Call for a Review of the Competitive Consequences of Hospital Mergers," en banc testimony before the Federal Trade Commission Hearings on Global and Innovation-Based Competition, Washington, D.C., November 14, 1995.

"Economic Perspectives on Compulsory Licensing of Intellectual Property," presented at the 3rd Annual Golden State Antitrust and Trade Regulation Institute, San Francisco, CA, October 27, 1995.

"Comments on the Use and Misuse of Innovation Market Analysis," en banc testimony before the Federal Trade Commission Hearings on Global and Innovation-Based Competition, Washington, D.C., October 25, 1995.

"An Economic Analysis of Unilateral Refusals to License Intellectual Property," presented at the National Academy of Sciences Colloquium on Science, Technology and the Economy, Irvine, CA, October 20-22, 1995.

"Discussion of 'Restructuring and Regulatory Reform in Network Industries; from Hierarchies to Markets'," by Paul Joskow, presented at the conference on Firms, Markets and Hierarchies, Berkeley, CA, October 6-8, 1995.

"Compulsory Licensing: Practical Facts and Economic Musings," American Bar Association Section of Antitrust Law, Annual Meeting, Chicago, IL, August 8, 1995. Also presented at Intellectual Property Antitrust 1995, Practising Law Institute, San Francisco, CA, July 20, 1995.

"Joint Venture Access Rules: An Antitrust Evaluation," American Bar Association Section of Antitrust Law, Annual Meeting, Chicago, IL, August 7, 1995.

"Competition in Electric Power Generation: Market Power and Market Pricing," Harvard Electricity Policy Group, Cambridge, MA, April 18, 1995.

"The 1995 Antitrust Guidelines for the Licensing of Intellectual Property: New Signposts for the Intersection of Intellectual Property and the Antitrust Laws," American Bar Association Section of Antitrust Law Spring Meeting, Washington, D.C., April 4, 1995. Also presented at The Aerospace Industries Association, Washington, D.C., April 20, 1995; The Fordham International Antitrust Conference, New York, NY, April 21, 1995.

"The Antitrust Agenda in the Clinton Administration," American Bar Association Business Law Section, March 24, 1995.

"The New Federal Antitrust Licensing Guidelines: The Music Behind the Words," Price Waterhouse Intellectual Property Conference, Tucson, AZ, February 23, 1995.

"Intellectual Property and the Antitrust Laws: Protecting Innovators and Innovation," Annual Winter Meeting of the Licensing Executives Society, Phoenix, AZ, February 17, 1995. Also presented at The Conference Board, New York, NY, March 2, 1995; The Antitrust '95 Conference, Washington, D.C., March 15, 1995.

"Traditional Antitrust for Non-Traditional Markets: The Case of High-Tech and Intellectual Property," American Bar Association Conference, Washington, D.C., November 17, 1994.

Interview in *Competition*, The Journal of the Antitrust and Trade Regulation Law Section of the State Bar of California, Vol. 4, No. 2, Fall 1994.

"The Antitrust Division Guidelines for Intellectual Property," Licensing Executives Society Annual Meeting, Crystal City, VA, September 12, 1994. Also presented at the Federal Bar Association, Washington, D.C., September 13, 1994; The Golden State Antitrust and Trade Regulation Institute, Los Angeles, CA, October 6, 1994; The Antitrust Conference, Washington, D.C., October 12, 1994; The American Intellectual Property Law Association, Washington, D.C., October 28, 1994; The Intellectual Property Owners Association, Washington, D.C., December 5, 1994; The New York State Bar Association, New York, NY, January 26, 1995.

"The Antitrust Division 1994 Intellectual Property Guidelines," ABA Antitrust Section, Amelia Island, FL, August 11, 1994.

"Emerging Issues in Intellectual Property Antitrust: Recent Antitrust Division Guidelines for Intellectual Property," ABA Annual Meeting, Antitrust Section, New Orleans, LA, August 9, 1994.

"Antitrust Issues Confronting High-Technology Companies in a Converging Industries Information Age: Mergers, Joint Ventures, Strategic Alliances," ABA Annual Meeting, Antitrust Section, New Orleans, LA, August 8, 1994.

"The Clinton Administration's Views on the Application of the Antitrust Laws to Intellectual Property, Technology Exploitation, and Innovation," Practising Law Institute, San Francisco, CA, July 15, 1994.

"Antitrust Policy in High Technology Markets: A View from the Antitrust Division," D.C. Bar Trade Regulation and Intellectual Property Committees, Washington, D.C., June 15, 1994; also presented at the D.C. Bar Association's Patent, Trademark, Copyright Section Annual Luncheon, Washington, D.C., June 21, 1994.

"The Use of Innovation Markets in Merger Analysis," Conference on Post-Chicago Economics, Washington, D.C., May 26, 1994.

"Antitrust and Regional Electricity Transmission Groups," Program on Workable Energy Regulation Annual Conference, Oakland, CA, May 19, 1994.

"The Antitrust Division Intellectual Property Task Force," American Intellectual Property Law Association, Cleveland, OH, April 22, 1994.

"Antitrust Issues in Patent Infringement Litigation: The Antitrust Counterattack," ABA Section of Antitrust Law 42nd Annual Spring Meeting, Washington, D.C., April 7, 1994.

"The Licensing of Intellectual Property," presented at San Francisco Patent and Trademark Law Association, San Francisco, CA, March 19, 1994.

"Intellectual Property," Law & Technology Seminar Workshop, Boalt School of Law, University of California, Berkeley, CA, March 16, 1994.

Statement submitted to the Subcommittee on Patents, Copyrights and Trademarks, Committee of the Judiciary, United States Senate, Concerning the Patent Term Publication Reform Act of 1994, March 9, 1994.

"Product Distribution Arrangements: Legal and Economic Issues," The Conference Board, New York, NY, March 3, 1994.

"Intellectual Property Licensing Issues: A View from the Antitrust Division," Practising Law Institute, New York, NY, March 1, 1994; also presented at San Francisco, CA, April 8, 1994.

"Mergers in High Technology Industries," presented at the Antitrust Practice Group, San Francisco, CA, February 4, 1994.

"Antitrust Policy in High Technology Markets," presented at the Conference of the Association of American Law Schools, Orlando, FL, January 7, 1994.

"An Equilibrium Theory of Rationing," presented at the Federal Trade Commission, Washington, D.C., November 17, 1993.

"Electric Power Regulatory Developments in the U.S.," presented at the POWER Conference on International Comparisons of Electricity Regulation, Toulouse, May 1993.

"A Review and Analysis of Electric Utility Conservation Incentives," presented at the POWER Conference on the Economics of Energy Conservation, Berkeley, June 1992.

"Asymmetric Gasoline Price Responses to Crude Oil Price Changes," presented at the NBER Conference on Industrial Organization, Boston, December 6, 1991.

"Do We Need a National Energy Strategy?" invited comments before the Subcommittee on Economic Stabilization, Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, October 17, 1991.

"Developments in Electricity Regulation," presented at the Latin American Meetings of the Econometrics Society, Montevideo, Uruguay, August 28, 1991.

Comments on the outlook for petroleum prices, KPIX-TV, January 15, 1991.

Comments on the petroleum industry, Public Radio Broadcasting Network, September 3, 1990.

"Developments in Energy Regulation," Conference on Bidding for Electric Power, Davis, Ca, March 1990.

"Pricing Delegation in Shared ATM Networks," Ammenberg Conference on Electronic Service Networks, February 1990.

"Outlook for Competition in Electric Power Markets," California Public Utility Commission, February 1990.

"Progress of Deregulation in the U.S.," Montevideo, Uruguay and Buenos Aires, Argentina, August 1989.

"Entry vs. Acquisition," Harvard University, March 1989; also presented at U.S. Department of Justice, October 1988.

"The Role of Potential Competition in Industrial Organization," invited lecture, Bank of San Paolo, Turin, Italy, June 1988.

"Competition in Electric Power Markets," Executive Seminar on Utility Regulation, University of California, Berkeley, June 1988.

"Multiproduct Competition," presented at University of California, April 1988. Also presented at Stanford University, May 1988, University of Florence, June 1988.

"Rate Reform in Competitive Electric Power Markets," presented at the Management Institute of Berlin, May 1987.

"Lectures in the Theory of Economic Regulation," presented at the Autonomous University of Barcelona, May 1987. Also presented at the Stockholm School of Economics, June 1987.

En Banc Testimony before the California Public Utilities Commission on revising rate-making mechanisms for electric utilities, March 1987.

"The Nuclear Industry After Chernobyl," University Explorer Series #860630, June 30, 1986.

BACKGROUND

Born January 14, 1945
Married (Sandra), two children (Alison, David)
U.S. citizen

October 1998

BIOGRAPHY OF MICHAEL L. KATZ

Michael L. Katz is the Edward J. and Mollie Arnold Professor of Business Administration at the University of California at Berkeley. He also holds an appointment as professor in the Department of Economics and serves as the Director of the Center for Telecommunications and Digital Convergence. He has twice won the Earl F. Cheit award for outstanding teaching.

Dr. Katz has published numerous articles on the economics of networks industries, intellectual property licensing, and cooperative research and development. He serves on the editorial boards of *The California Management Review* and *The Journal of Economics and Management Strategy*.

Dr. Katz served as Chief Economist of the Federal Communications Commission from January 1994 through January 1996. He participated in the formulation and analysis of policies toward all industries under Commission jurisdiction, including broadcasting, cable, telephone, and wireless communications.

Dr. Katz holds an A.B. *summa cum laude* from Harvard University and a D.Phil. from Oxford University. Both degrees are in economics.

Background on Robert E. Litan

Robert E. Litan is the Director of the Economic Studies Program and Cabot Family Chair in Economics at the Brookings Institution, where he served as a Senior Fellow from 1984-1993 and from 1987 through 1993 as Director of two research centers in the Program. He is both an economist and an attorney.

During his career at Brookings, Dr. Litan has authored, co-authored or edited 19 books and over 100 articles in journals, magazines and newspapers on government policies affecting financial institutions, regulatory and legal issues, international trade, and the economy in general. His most recent books include *Globaphobia: Confronting Fears About Open Trade* (with Gary Burtless, Robert Lawrence and Robert Shapiro); *Going Digital!* (with William Niskanen); and *American Finance for the 21st Century* (with Jonathan Rauch); and *None of Your Business: World Data Flows and the European Privacy Directive* (with Peter Swire). Dr. Litan is also co-editor of the *Brookings-Wharton Papers on Financial Services*. He currently is working on a book on the future of international finance in the next century.

Dr. Litan has also studied the economics of disasters. He is the co-author of Physical Damage and Human Loss: The Economic Impact of Earthquake Mitigation Measures, published by the Insurance Information Institute in 1992 and the author of A National Earthquake Mitigation and Insurance Plan: Response to Market Failures, published by the Earthquake Project in 1991. For the past year, he has served as chairman the National Research Council's Committee on Disaster Loss Estimation, whose report is expected later this year [1999].

Dr. Litan has served in several capacities in the federal government. During 1995 and 1996, he was Associate Director of the Office of Management and Budget (where he was responsible for overseeing budgetary and other policies of six cabinet agencies). From 1993 to 1995, he was Deputy Assistant Attorney General, in charge of civil antitrust litigation and regulatory issues (including telecommunications policy), at the Department of Justice. From 1977 to 1979, he was the regulatory and legal staff specialist at the President's Council of Economic Advisers. In the early 1990s, Dr. Litan was a Member of the Commission on the Causes of the Savings and Loan Crisis created by the U.S. Congress.

Dr. Litan has practiced law with two Washington law firms, specializing in regulatory litigation, banking, and international trade matters. He was an associate attorney at Arnold & Porter from 1979 to 1982. From 1982 through 1990, he was affiliated with Powell, Goldstein, Frazer & Murphy, first as a senior associate, then as a partner, and subsequently as Counsel (during the period he was also at Brookings).

Dr. Litan has consulted for numerous organizations, public and private, and testified as an expert witness in a variety of legal and regulatory proceedings. During 1996-97 he has served as a consultant to the Treasury Department on its report to Congress on the future of the U.S. financial services industry. He also has spoken on a variety of economic issues before audiences throughout the world.

Dr. Litan received his B.S. in Economics (*summa cum laude*) from the Wharton School of Finance at the University of Pennsylvania; his J.D. from Yale Law School; and both his M. Phil. and Ph.D. in Economics from Yale University.

CURRICULUM VITAE
ROGER G. NOLL

PERSONAL

Date and Place of Birth: March 13, 1940; Monterey Park, California
Married to Robyn Schreiber Noll; daughter, Kimberlee Elizabeth

EDUCATION

East High School, Salt Lake City, Utah, 1958
B.S. (Math, Honor), California Institute of Technology, 1962
A.M., Ph.D. (Economics), Harvard University, 1965, 1967

SCHOLARSHIPS, FELLOWSHIPS AND AWARDS

National Merit Scholarship 1958-62
National Defense Education Act Fellowship 1962-66 (declined)
Harvard Prize Fellowship 1962-63
National Science Foundation Fellowship 1963-64
Guggenheim Fellow 1983-84
Rhodes Prize for Undergraduate Teaching, Stanford University, 1994

POSITIONS HELD

Teaching Fellow, Harvard University, 1964-65
Instructor, California Institute of Technology, 1965-67
Assistant Professor, California Institute of Technology, 1967-69
Senior Staff Economist, Council of Economic Advisers, 1967-68
Associate Professor, California Institute of Technology, 1969-71
Senior Fellow and Co-director of Brookings Studies in the Regulation of Economic Activity, Brookings Institution, 1970-73
Professor, California Institute of Technology, 1973-82
Visiting Professor, Graduate School of Business, Stanford University, 1976-77
Chairman, Division of the Humanities and Social Sciences, California Institute of Technology, 1978-82
Reuben Gustavson Lecturer, University of Chicago, April 1981
Institute Professor of Social Sciences, California Institute of Technology, 1982-84
Donald Gilbert Memorial Lecturer, University of Rochester, December 1982
Fellow, Center for Advanced Study in the Behavioral Sciences, 1983-84
Professor of Economics, Stanford University, 1984-
Visiting Scholar, Hoover Institution, 1984-85
Professor by Courtesy, Department of Political Science, Stanford University, 1985-
Professor by Courtesy, Graduate School of Business, Stanford University, 1986-
Veblen-Clark Lecturer, Carleton College, May 1986
Director, Public Policy Program, Stanford University, 1986-
David Kinley Lecturer, University of Illinois, May 1987
Sunderland Fellow, Law School, University of Michigan, Fall 1988
Morris M. Doyle Centennial Professor in Public Policy, Stanford University, 1990-
Jean Monnet Professor, European University Institute, May 1991
Associate Dean, Humanities and Sciences, Stanford University, 1991-92
Visiting Professor, University of California, San Diego, Winter and Spring 1993
Visiting Fellow, Brookings Institution, 1995-96
Nonresident Senior Fellow, Brookings Institution, 1996-

TEACHING EXPERIENCE

Undergraduate: Introductory Economics, Intermediate Microeconomic Theory, Statistical Methods in Economics, Economic History of Medieval Europe, Contemporary Socioeconomic Problems, Advanced Topics in Microeconomics, History of Economic Thought, Economic Policy Analysis, Politics of Government Reform, Economics of Sports

Graduate: Public Policy Analysis, Government Regulation of Business, Applied Microeconomic Theory, Experimental Methods

RESEARCH INTERESTS

Applied Microeconomics, Social Control of Business, Political Economics, Legal Institutions

MEMBERSHIPS ON COMMITTEES AND BOARDS

President's Task Force on Communications Policy (CEA Staff Representative and Alternate Member), 1967-68
 Commerce Technical Advisory Board Panel on Venture Capital, 1968-69
 Committee on the Multiple Uses of the Coastal Zone, National Council on Marine Resources and Engineering, 1968
 Secretary, President's Interagency Task Force on Income Maintenance, 1968
 Task Force on Application of Economic Analysis of Transportation Problems, National Research Council (NAS/NAE), 1970-73
 Committee on Technological Forecasting on Behalf of the Environment, Office of Science and Technology, 1970-71
 Board of Economic Advisers, Public Interest Economics Foundation, 1974-84
 Executive Committee, Vice Chair Staff Committee, Caltech Environmental Quality Laboratory, 1970-71
 Faculty Board, Caltech, 1974-76
 Advisory Commission on Regulatory Reform, Senate Committee on Government Operations, 1975-77
 Chairman, Fourth Annual Telecommunications Policy Research Conference, 1975-76
 Committee on Satellite Communications, National Academy of Sciences, 1975-76
 Advisory Council, Jet Propulsion Laboratory, 1976-82
 Chairman, Committee to Monitor the Desegregation Plan of the Los Angeles Unified School District, Los Angeles Superior Court, 1978-79
 Advisory Council, National Aeronautics and Space Administration, 1978-81
 Advisory Council, National Science Foundation, 1978-89
 Board of Advisers, National Institute of Economics and Law, 1978-84
 Research Advisory Board, Committee for Economic Development, 1979-82
 President's Commission for a National Agenda for the Eighties, 1980
 Board of Directors, Owen Greenhalgh and Myslinski, Inc., 1981-
 Review Panel, NSF Regulation and Public Policy Program, 1981-84
 Board of Editors, Journal of Economic Literature, 1981-90
 Advisory Board, Solar Energy Research Institute, 1982-91
 Board of Directors, Cornell Pelcovits and Brenner, Inc., 1982-1988
 Chairman, Advisory Panel on Information Technology R&D, Office of Technology Assessment, 1983-84
 Supervisory Board of Editors, Information Economics and Policy, 1982-88 Coordinating Editor, Information Economics and Policy, 1988-92
 Advisory Committee on Integrated Environmental Management Program, Environmental Protection Agency, 1983-85

Memberships on Committees and Boards, cont'd 3

Commission on Behavioral and Social Sciences and Education, National Academy of Sciences, National Research Council, 1984-90
Advisory Panel, NSF Policy Research and Analysis Division, 1984
Science Advisory Board, Panel on Clean Air, Environmental Protection Agency, 1985-86
Board of Editors, Review of Economics and Statistics, 1985-
Contributing Editor, Regulation, 1986-93
Energy Research Advisory Board, Department of Energy, 1986-89
President & Chairman of the Board, Telecommunications Policy Research Foundation, 1986-87
Board of Directors, International Telecommunications Society, 1988-92
Acid Rain Advisory Committee, Environmental Protection Agency, 1990-91
Secretary of Energy Advisory Board, 1990-95
Faculty Senate, Stanford 1993-95, 98-00
California Council on Science and Technology, 1995-
Panel on Universities, President's Committee of Advisors on Science and Technology, 1996
Committee on Intellectual Property and the Information Infrastructure, National Research Council, 1998-

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SPONSORED RESEARCH

"Opinions of Policemen." International Association of Chiefs of Police, 1969
"Studies in the Regulation of Economic Activity." Brookings Institution and Ford Foundation, 1970- 3
"Government Policies and Technological Innovation." National Science Foundation National R&D Assessment Program, 1973-4
"The Social Consequences of Earthquake Prediction," National Aeronautics and Space Administration, 1974-6
"Nuclear Safety Regulation." National Science Foundation RANN Program, 1975-7
"The Public Television Station Program Cooperative." National Science Foundation RANN Program, 1975-7
"The Station Allocation Game." Federal Communications Commission, 1977
"Energy Policy Studies." Various donors, 1978-84
"Economics of Oil Leasing" and "Issues in Utility Pricing." Department of Energy, 1978-9
"The Economics of Boxing, Wrestling and Karate." California Athletic Commission, 1978
"Implementing Tradable Emissions Permits." California Air Resources Board, 1979-82
"Social Science and Regulatory Policy." National Science Foundation, 1980-2
"The Political Economy of Public Policy." National Science Foundation and Center for Economic Policy Research, Stanford University, 1983-4
"CEPR Program in Regulatory Policy." Various donors, 1987-
"The Economics of Research Universities and Scholarly Communication." Brown Center for Education Policy, Brookings Institution, 1995-6
"Coordination of Regulatory Reform," Organization for Economic Cooperation and Development, 1996
"The Future of the Research University," Carnegie Foundation, 1996

CONSULTANTSHIPS

President's Task Force on Suburban Problems, 1968
President's Committee on Urban Housing, 1968
Special Assistant to the President, Ford Foundation, 1969
Space Technology Applications, Jet Propulsion Laboratory, 1969
Panel on the Abatement of Particulate Emissions, National Research Council (NAS/NAE), 1971
Sloan Commission on Cable Communications, 1971
President's Commission on Government Procurement, 1971

Memberships on Committees and Boards, cont'd 4

Senate Antitrust Subcommittee, 1972
MCI, Inc., 1972-73, 1983, 1986
National Science Foundation, 1973, 1975
Department of Justice, Antitrust Division, 1974-77, 1979-81, 1993-97
Internal Revenue Service, 1976-77
RAND Corporation, 1974-82
Los Angeles Lakers, 1974-75
National Football League Players Association, 1974-76, 1987-93.
Office of Telecommunications Policy, 1975-77
National Basketball Association Players Association, 1975-76, 1987-88, 1994
Naval Ordnance Test Station, 1975
Commission on Law and the Economy, American Bar Association, 1977-78
Aspen Institute Program on Communications and Society, 1977
National Commission on Electronic Funds Transfer, 1977
Business Round Table, 1978
Federal Communications Commission, 1977-81
Food and Drug Administration, 1978
Carnegie Commission on the Future of Public Broadcasting, 1978
Department of Energy, 1979
Office of Technology Assessment, 1980
Kerr-McGee Corporation, 1980
CBS, Inc. 1982-83
Environmental Protection Agency, 1982-83
Showtime/The Movie Channel, 1983, 1985
Harlequin Books, 1984
Lake Huron Broadcasting, 1984
National Collegiate Athletics Association, 1984
National Medical Enterprises, 1985, 1987-88
Camilla City Telecasters, 1985-86
Brown and Root, Inc., 1985-86
McDermott, Inc., 1985-86
Major League Baseball Players Association, 1985, 1994
United Cable Television and American Television and Communications, 1985
United States Football League, 1985-86
City of Anaheim, 1986
Technicolor, 1986
Metro-Mobile, 1986-89
Hewlett-Packard, 1986-1990, 1991
Echosphere, 1987, 1994-95
Continental Airlines, 1987-88
Home Box Office, 1988-89
Houston Tracker, 1988
Bell South Cellular, 1989
Western Union, 1989
Minnesota Twins, 1989
Northwest Airlines, 1989
Pepsico, 1989
Yellow Phone, 1989-91
Dialog, 1990-91
California Public Utilities Commission, 1989-90
American Newspaper Publishers Association, 1990

Humana, 1990-91
Powell, Goldstein, Frazer and Murphy, 1990-93
South Coast Air Quality Management District, 1990-91
Federal Trade Commission, 1990-91
Delta Airlines, 1991
California Cable Television Association, 1991
Bureau of Competition Policy, Government of Canada, 1991
R&D Business Systems, *et al.* 1991-95
International Entertainment Group, 1992-93
Nike, Inc., 1992
World Bank, 1992-
Gemini, Inc. 1992-94
Servicetrends, Inc., 1993-94
William Sullivan, 1993-95
Sure Safe Industries, 1993
Department of Justice, Civil Division 1994-95
Kopies, Inc., *et al.* 1995-
Telecomm Technical Services, *et al.*, 1995-
Digital Distribution, Inc.. 1996-
Silvey, *et al.*, 1996-
Aguillar, *et al.* 1996-
Wadley Medical Center, 1997-
Oakland Raiders, 1997-
Major League Soccer Players Association, 1997-
Class Plaintiffs, Brand Name Prescription Drugs Litigation, 1998

BOOKS

Reforming Regulation: An Evaluation of the Ash Council Report. Brookings Staff Paper. Brookings Institution, 1971.

Economic Aspects of Television Regulation, co-authors Merton J. Peck and John J. McGowan. Brookings Institution, 1973. Winner of the National Association of Educational Broadcasters Annual Book Award, 1974.

Government and the Sports Business, editor. Brookings Institution, 1974.

The Political Economy of Deregulation, co-author Bruce Owen. American Enterprise Institute, 1983.

Regulatory Policy and the Social Sciences, editor. University of California Press, 1985.

The Technology Pork Barrel, co-author Linda R. Cohen. Brookings Institution, 1991.

The Economics and Politics of Deregulation. European University Institute, 1991.

Constitutional Reform in California: Making State Government More Effective and Responsive, co-editor Bruce E. Cain. University of California Institute of Governmental Studies, 1995.

Sports, Jobs, and Taxes, co-editor Andrew Zimbalist. Brookings Institution, 1997.

Challenges to Research Universities, editor. Brookings Institution, 1998.

Books, cont'd

A Communications Cornucopia, co-editor Monroe E. Price. Brookings Institution, 1998.

ARTICLES IN SCHOLARLY PUBLICATIONS

"Urban Concentration: Prospects and Implications." In Increasing Understanding of Public Problems and Policies. Farm Foundation, 1969.

"Metropolitan Employment and Population Distribution and the Conditions of the Urban Poor." In Financing the Metropolis: Public Policy in Urban Economics: The Urban Affairs Annual Reviews, IV, John P. Crecine, ed. Sage Publications, 1970. Brookings Reprint No. 184.

"National Communications Policy: Discussion--Spectrum Allocation Without Markets." Economic Review, Vol. 60, No. 2 (May 1970).

"Summary and Conclusions," co-author William Capron. In Technological Change in Regulated Industries, William Capron, ed. Brookings Institution, 1971.

"Mass Balance, General Equilibrium and Environmental Externalities," co-author, John Trijonis. American Economic Review, Vol. 61, No. 4 (September 1971): 730-735.

1971): "The Nature and Causes of Regulatory Failure." Administrative Law Review, Vol. 23, No. 4 (June 1971): 424-437. Revised version published as "The Economics and Politics of Regulation." Virginia Law Review, Vol. 57, No. 6 (September 1971): 1016-1032.

"The Behavior of Regulatory Agencies." Review of Social Economics, Vol. 24, No. 1 (March 1971): 15-19. Brookings Reprint No. 219 (November 1971).

"Selling Research to Regulatory Agencies." In The Role of Analysis in Regulatory Decisionmaking: The Case of Cable Television, Rolla Edward Park, ed. Heath-Lexington, 1973.

"Relative Prices on Regulated Transactions of the Natural Gas Pipelines," co-author Paul W. MacAvoy. Bell Journal of Economics and Management Science, Vol. 4, No. 1 (Spring 1973): 212-234.

"Regulating Prices in Competitive Markets," co-author Lewis A. Rivlin. Yale Law Journal, Vol. 82, No. 7 (June 1973): 1426-1434.

"The U.S. Team Sports Industry." In Government and the Sports Business, Roger G. Noll, editor. Brookings Institution, 1974. Abridged version reprinted in Public Policies Toward Business: Readings and Cases, William G. Shephard, ed. Irwin, 1975.

"Attendance and Price Setting." In Government and the Sports Business, Roger G. Noll, ed. Brookings Institution, 1974.

"Alternatives in Sports Policy." In Government and the Sports Business, Roger G. Noll, ed. Brookings Institution, 1974. Abridged version in Public Policies Toward Business: Readings

and Cases, William G. Shephard, ed. Irwin 1975. Revised version in Handbook of Social Science of Sport, Gunther R. R. Luschen and George H. Sage, eds. Stripes Publishing Co., 1980.

"The Social Costs of Government Intervention." In The Business-Government Relationship in American Society: Reassessment, Neil H. Jacoby, editor. University of California Press, 1975.

"The Consequence of Public Utility Regulation of Hospitals." In Controls on Health Care. Washington, D.C.: National Academy of Sciences, 1975.

"Information, Decision-Making Procedures and Energy Policy." American Behavioral Scientists, Vol. 19, No. 3 (January/February 1976): 267-278. Reprinted in Current Issues in Social Policy, W. B. Littrell and G. Sjoberg, eds. Sage, 1976.

"Breaking Out of the Regulatory Dilemma: Alternatives to the Sterile Choice." Indiana Law Journal, Vol. 51, No. 3 (Spring 1976): 686-699. Reprinted in Corporate Practice Commentator, Vol. 19, No. 1 (Spring 1977): 99-114.

"Safety Regulation," co-authors Nina Cornell and Barry Weingast. In Setting National Priorities: The Next Ten Years, Henry Owen and Charles L. Schultze, eds. Brookings Institution, 1976.

"Major League Team Sports." In The Structure of American Industry, Walter Adams, ed. 5th ed. Macmillan, 1977. 6th ed. Macmillan, 1981.

"An Experimental Market for Public Goods: The PBS Program Cooperative," co-author John A. Ferejohn. American Economic Review Papers and Proceedings, Vol. 66, No. 2 (May 1976): 267-273.

"Government Policy and Technological Innovation: Where Do We Stand and Where Do We Go?" In Innovation, Economic Change and Technology Policies, K.A. Stroetmann, ed. Birkauer-Verlag, 1977. Also in Government Policies and Technological Innovation, Vol. I. National Technical Information Service, 1974.

"Economic Policy Research on Cable Television: Assessing the Costs and Benefits of Cable Deregulation," co-authors S.M. Besen, B.M. Mitchell, B.M. Owen, R.E. Park, and J.N. Rosse. In Deregulation of Cable Television, Paul W. MacAvoy, ed. American Enterprise Institute, 1977.

"The Economic Implications of Regulation by Expertise: The Case of Recombinant DNA Research," co-author Paul A. Thomas. In Research with Recombinant DNA. National Academy of Sciences, 1977.

"The Dilemma of Consumer Advocacy." In Regulatory Reform, W.S. Moore, ed. American Enterprise Institute, 1978.

"Uncertainty and the Formal Theory of Political Campaigns," co-author John A. Ferejohn. American Political Science Review, Vol. 72, No. 2 (June 1978): 492-505.

"Voters, Bureaucrats and Legislators: A Rational Choice Perspective on the Growth of Bureaucracy," co-author Morris P. Fiorina. Journal of Public Economics, Vol. 9, No. 3 (May

1978): 239-254.

"Public Utilities and Solar Energy Development--Institutional Economic Considerations." In On the Economics of Solar Energy, Stephen L. Feldman and Robert M. Wirtshafter, eds. D.C. Heath, Lexington books, 1980. Extended version in The Solar Market: Proceedings of the Symposium on Competition in the Solar Industry. Federal Trade Commission, 1978.

"The Rationale for Mandated Cost Increases." In Economic Effects of Government-Mandated Costs, Robert F. Lanzillotti, ed. University Presses of Florida, 1978.

"An Experimental Analysis of Decisionmaking Procedures for Discrete Public Goods: A Case Study of a Problem in Institutional Design," co-authors John A. Ferejohn and Robert E. Forsythe. In Research in Experimental Economics, Vol. I, Vernon L. Smith, ed. JAI Press, 1979.

"Voters, Legislators and Bureaucracy: Institutional Design in the Public Sector," co-author Morris P. Fiorina. American Economic Review Papers and Proceedings, Vol. 68, No. 2 (May 1978): 256-260. Translated into Italian in Problemi Di Amministrazione Pubblica, Vol. 4, No. 2 (1979): 69-89.

"Regulation and Computer Services." In The Computer Age, Michael L. Dertouzos and Joel Moses, eds. MIT Press, 1979, pp. 254-284.

"Practical Aspects of the Construction of Decentralized Decisionmaking Systems for Public Goods," co-authors John A. Ferejohn and Robert Forsythe. In Collective Decisionmaking, Clifford S. Russell, ed. Resources for the Future, 1979.

"Majority Rule Models and Legislative Elections," co-author Morris P. Fiorina. Journal of Politics, Vol. 41, No. 4 (November 1979): 1081-1104.

"Regulatory and Nonregulatory Strategies for Controlling Health Care Costs," co-author Alain Enthoven. In Medical Technology: The Culprit Behind Health Care Costs, Stuart H. Altman and Robert Blendon, eds. Sun Valley Forum on National Health. U.S. Department of Health, Education and Welfare Publication No. (PHS) 79-3216, 1979.

"The Game of Health Care Regulation: Comments on Feldman/Roberts." In Issues in Health Care Regulation, Richard S. Gordon, ed. McGraw-Hill Book Co., 1980.

"Discussion: Regulatory Institutions in Historical Perspective." American Economic Review Vol. 70, No. 2 (May 1980): 316-317.

"The Economics of Disaster Defense: The Case of Building Codes to Resist Seismic Shock," co-author Linda Cohen. Public Policy, Vol. 29, No. 1 (Winter 1981): 1-29.

"Regulation in Theory and Practice: An Overview," co-author Paul L. Joskow. In Studies in Public Regulation, Gary Fromm, ed. MIT Press, 1981.

"Designing a Market for Tradable Emissions Permits," co-author Robert W. Hahn. In Reform of Environmental Regulation, Wesley Magat, ed. Lexington Books, 1982.

"Implementing Marketable Emissions Permits." American Economic Review Papers and

Proceedings, Vol. 72, No. 2 (May 1982): 120-124.

"Implementing Tradable Emissions Permits," co-author Robert W. Hahn. In Reforming Social Regulation, Leroy Graymer and Frederick Thompson, eds. Sage Publications, 1982.

"An Experimental Examination of Auction Mechanisms for Discrete Public Goods," co-authors John A. Ferejohn, Robert Forsythe and Thomas R. Palfrey. In Research in Experimental Economics, Vol. II, Vernon L. Smith, ed. JAI Press, 1982. Reprinted in Experimental Foundations of Political Science, Donald R. Kinder and Thomas R. Palfrey, eds. University of Michigan Press, 1993.

"The Feasibility of Marketable Emissions Permits in the U.S." In Public Sector Economics, Jorg Finsinger, ed. Macmillan Press, Ltd., 1983.

"Barriers to Implementing Tradable Air Pollution Permits: Problems of Regulatory Interactions," co-author Robert W. Hahn. Yale Journal of Regulation, Vol. 1, No. 1 (1983): 63-91.

"The Future of Telecommunication Regulation." In Telecommunications Today and Tomorrow, Eli Noam, ed. Harcourt Brace Jovanovich, 1983.

"The Case Against the Balanced Budget Amendment: Comments on Aranson and Rabushka." In The Economic Consequences of Government Deficits, Laurence H. Meyer, ed. Kluwer-Nyhoff Publishing, 1983.

"The Political Foundations of Regulatory Policy." Zeitschrift fur die gesamte Staatswissenschaft (Journal of Institutional and Theoretical Economics), Vol. 139, No. 3 (1983): 377-404. Reprinted in Congress: Structure and Policy, Mathew McCubbins and Terry Sullivan, eds. Cambridge University Press, 1987.

"The Regulation of Surface Freight Transportation: The Welfare Effects Revisited," co-author Ronald R. Braeutigam. The Review of Economics and Statistics, Vol. 66, No. 1 (1984): 80-87.

"Prospective Payment: Will It Solve Medicare's Financial Problem," co-author Alain C. Enthoven. Issues in Science and Technology, Vol. 1, No. 1 (1984): 111-116. Reprinted in Health Industry Today, Vol. 48, No. 3 (1985): 16-24.

"'Let Them Make Toll Calls': A State Regulator's Lament." American Economic Review Papers and Proceedings, Vol. 75, No. 2 (1985): 52-56.

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