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EDUCATION

- 1968-1973 Columbia University, New York, New York
Graduate Department of Economics and European Institute of the School of International Affairs
Doctoral Dissertation: Three Essays on Economic Theory, May 1973
- 1967-1968 McGill University, Montreal, Canada
Departments of Economics and Political Science
- 1963-1966 Warsaw University, Warsaw, Poland
Department of Political Economy

HONORS

- 1973 Columbia University: Highest distinction for the doctoral dissertation
- 1971-1972 Columbia University: Honorary President's Fellow
- 1969-1971 Columbia University: President's Fellow
- 1967-1968 McGill University: Honors Student
- 1964, 1965 Warsaw University: Award for Academic Achievement, Department of Political Economy
- Who's Who in the World
Who's Who in America
Who's Who in the East

PROFESSIONAL EXPERIENCE

- June 1982 - present Professor of Economics
Department of Economics, New York University, New York, New York
- Sept. 1996 - present Director of Masters in Economics Program
Department of Economics, New York University
- Summer 1996- present Lecturer
International Program on Privatization and Reform
Institute for International Development, Harvard University, Cambridge, Massachusetts

Professional Experience (continued)

- Aug. 1991 - Deputy Assistant Attorney General for Economics
Oct. 1992 Antitrust Division
United States Department of Justice, Washington, D.C.
- Sept. 1989 - Visiting Professor of Economics
July 1990 School of Management and Organization, Yale University, New Haven, Connecticut
- Lecturer in Law
Yale Law School
- Mar. 1984 - Visiting Professor of Economics
June 1988 Universita Commerciale "Luigi Bocconi", Milan, Italy.
- June 1982 - Director of Graduate Studies
Feb. 1985 Department of Economics, New York University
- Sept. 1982 - Adjunct Professor of Law (part-time)
June 1986 Columbia University Law School, New York, New York
- Feb. 1982 - Acting Director of Graduate Studies
June 1982 Department of Economics, New York University
- June 1978 - Associate Professor of Economics
June 1982 Department of Economics, New York University
- Sept. 1979 - Lecturer in Economics and Antitrust
May 1990 New York University Law School
- Sept. 1977 - Member, Technical Staff
June 1978 Bell Laboratories, Holmdel, New Jersey
- Associate Professor of Economics
Columbia University
- Visiting Research Scholar
Center for Law and Economics, University of Miami, Miami, Florida
- Sept. 1973 - Assistant Professor of Economics
Aug. 1977 New York University
- Summer 1976 Fellow
Legal Institute for Economists, Center for Law and Economics, University of Miami
- Summer 1976 Visiting Researcher
Bell Laboratories, Holmdel, New Jersey

OTHER PROFESSIONAL ACTIVITIES

1997 - present Consultant
Inter-American Development Bank, Washington, D.C.

1997 - present Board of Editors
Antitrust Report

1995 - present Consultant
The World Bank, Washington, D.C.

1995 - present Senior Affiliate
Cornerstone Research, Inc., Palo Alto, California

Fall 1995 Testimony, Hearings of the Federal Trade Commission
"Anticipating the 21st Century: Competition Policy in the New High-Tech, Global Marketplace,"
Washington, D.C.

1994 - 1996 Senior Affiliate
Law and Economics Consulting Group, Emoryville, California

1994 - present Senior Affiliate
Consultants in Industry Economics, LLC, Princeton, New Jersey

1993 - 1994 Director
Consultants in Industry Economics, Inc., Princeton, New Jersey

1992 - 1993 Vice-Chair (*pro tempore*)
Economics Committee, American Bar Association, Chicago, Illinois

1992 - 1995 Senior Consultant
1990 - 1991 Organization for Economic Cooperation and Development, Paris, France

1991 Member
Ad hoc Working Group on Bulgaria's Draft Antitrust Law
The Central and East European Law Initiative
American Bar Association

1990 - 1991 Advisor
Polish Ministry of Finance and Anti-Monopoly Office
Warsaw, Poland

1990 - 1991 Member
Special Committee on Antitrust
Section of Antitrust Law, American Bar Association

1990 - 1991 Director and Senior Advisor
Putnam, Hayes & Bartlett, Inc., Washington, D.C.

Other Professional Activities (continued)

- 1990 - 1996 Member
Predatory Pricing Monograph Task Force
Section of Antitrust Law, American Bar Association
- April 12, 1989 Witness
Hearings on Competitive Issues in the Cable TV Industry
Subcommittee on Monopolies and Business Rights of the Senate Judiciary Committee
Washington, D.C.
- 1989 Member
EEC Merger Control Task Force, American Bar Association
- 1988 - present Associate Member
American Bar Association
- 1987 - 1989 Adjunct Member
Antitrust and Trade Regulation Committee, The Association of the Bar of the City of New York
- 1984 Speaker, "Industrial and Intellectual Property: The Antitrust Interface"
National Institutes, American Bar Association, Philadelphia, Pennsylvania
- 1983 - 1990 Director
Consultants in Industry Economics, Inc.
- 1982 Member
Organizing Committee
Tenth Annual Telecommunications Policy Research Conference, Annapolis, Maryland
- 1981 Member
Section 7 Clayton Act Committee, Project on Revising Merger Guidelines
American Bar Association
- 1980 Organizer
Invited Session on Law and Economics
American Economic Association Meetings, Denver, Colorado
- 1978 - 1979 Member
Department of Commerce Technical Advisory Board
Scientific and Technical Information Economics and Pricing Subgroup
- 1978 - present Referee for numerous scholarly journals, publishers, and the National Science Foundation

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Economic Association
American Bar Association

PUBLICATIONS**A. Journal Articles**

"Parity Pricing and its Critics: Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," with W. J. Baumol and R.D. Willig, *Yale Journal on Regulation*, vol. 14, Winter 1997, 146-63.

"Competition and Trade Law and the Case for a Modest Linkage," with E. Fox, *World Competition, Law and Economics Review*, vol. 19, December 1995, 5-34.

"On the Perils of Vertical Control by a Partial Owner of Downstream Enterprise," with W.J. Baumol, *Revue D'économie industrielle*, No. 69, 3^e trimestre 1994, 7-20.

"Competition Policy for Natural Monopolies in Developing Market Economy," with R. W. Pittman and P. Clyde, *Economics of Transition*, vol. 2, no. 3, September 1994, 317-343. Reprinted in B. Clay (ed), *De-monopolization and Competition Policy in Post-Communist Economies*, Westview Press 1996, 159-193.

"The 1992 Agency Horizontal Merger Guidelines and the Department of Justice's Approach to Bank Merger Analysis," with M. Guerin-Calvert, *Antitrust Bulletin*, vol. 37, no. 3, 667-688. Reprinted in *Proceedings of the 1992 Conference on Bank Structure and Competition: Credit Markets in Transition*, Federal Reserve Bank of Chicago, 1992, 541-560.

"Entry Analysis Under the 1992 Horizontal Merger Guidelines," with Jonathan B. Baker, *Antitrust Law Journal*, vol. 61, no. 1, Summer 1992, 139-146.

"Economics and the 1992 Merger Guidelines: A Brief Survey," with Robert D. Willig, *Review of Industrial Organization*, vol. 8, 139-150, 1993. Reprinted in E. Fox and J. Halverson (eds.), *Collaborations Among Competitors: Antitrust Policy and Economics*, American Bar Association, 1992, 639-652.

"Equilibrium Vertical Foreclosure: A Reply," with G. Saloner and S.A. Salop, *American Economic Review*, vol. 82, no. 3, 1992, 698-703.

"A Patent System for Both Diffusion and Exclusion," *Journal of Economic Perspectives*, vol. 5, Winter 1991, 43-60.

"R&D Cooperation and Competition," with M. Katz, *Brookings Papers on Economic Activity: Microeconomics*, 1990, 137-203.

"Equilibrium Vertical Foreclosure," with G. Saloner and S. Salop, *American Economic Review*, vol. 80, March 1990, 127-142.

"Antitrust Policy for High-Technology Industries," with W.J. Baumol, *Oxford Review of Economic Policy*, vol. 4, Winter 1988, 13-34. Reprinted in E. Fox and J. Halverson (eds.), *Collaborations Among Competitors: Antitrust Policy and Economics*, American Bar Association, 1991, 949-984.

"Conflicts of Jurisdiction: Antitrust and Industrial Policy," *Law and Contemporary Problems*, vol. 50, Summer 1987, 165-178.

"Market Structure and Optimal Management Organization," with C. Bull, *Rand Journal of Economics*, vol. 18, no. 4, Winter 1987, 480-491.

A. Journal Articles (continued)

"A Sequential Concession Game with Asymmetric Information," with A. Rubinstein, *Quarterly Journal of Economics*, vol. 101, no.4, November 1986, 879-888.

"The G.M.-Toyota Joint Venture: An Economic Assessment," with C. Shapiro, *Wayne Law Journal*, vol. 31, no. 4, 1985, 1167-1194.

"Economic Foundations and Considerations in Protecting Industrial and Intellectual Property: An Introduction," *ABA Antitrust Law Journal*, vol. 53, no. 3, 1985. 503-518, Comments, 523-532.

"Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers," with R.D. Willig, *Journal of Law and Economics*, vol. 28, May 1985, 311-334.

"Use of Antitrust to Subvert Competition," with W.J. Baumol, *Journal of Law and Economics*, vol. 28, May 1985, 247-266. Reprinted in *Journal of Reprints for Antitrust Law and Economics*, vol. 16, no. 2.

"Advances in Supervision Technology and Economic Welfare: A General Equilibrium Analysis," with C. Shapiro, *Journal of Public Economics*, vol. 25/3, 1985, 371-390.

"Predatory Systems Rivalry: A Reply," with A.O. Sykes and R.D. Willig, 83 *Columbia Law Review*, June 1983, 1150-1166. Reprinted in *Corporate Counsel*, Matthew Bender & Company, 1984, 433-450.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," with R.D. Willig, 71 *California Law Review*, March 1983, 535-574. Reprinted in *Antitrust Policy in Transition: The Convergence of Law and Economics*, E. Fox and J. Halverson (eds.), American Bar Association Press, 1984, 267-304.

"Unfair International Trade Practices," with A. Sykes and R.D. Willig, 15 *Journal of International Law and Politics*, Winter 1983, 323-338.

"On Non-linear Pricing of Inputs," with J. Panzar, *International Economic Review*, October 1982, 659-675.

"Herfindahl Concentration, Rivalry and Mergers," with A. Sykes and R.D. Willig, *Harvard Law Review*, vol. 95, June 1982, 1857-1875.

"A Reply to 'Journals as Shared Goods: Comment,'" with R.D. Willig, *American Economic Review*, June 1982, 603-607.

"Proposed Revisions to the Justice Department's Merger Guidelines," with S. Edwards, *et al.*, *Columbia Law Review*, vol. 81, December 1981, 1543-1591.

"An Economic Definition of Predation: Pricing and Product Innovation," with R.D. Willig, *Yale Law Journal*, vol. 91, November 1981, 8-53.

"On the Consequences of Costly Litigation in the Model of Single Activity Accidents: Some New Results," *Journal of Legal Studies*, June 1981, 269-291.

"On the Political Sustainability of Taxes," with A. Schotter, *American Economic Review Papers and Proceedings*, May 1981, 278-282.

A. Journal Articles (continued)

"Information and the Law: Evaluating Legal Restrictions on Competitive Contracts," with A. Weiss, *American Economic Review Papers and Proceedings*, May 1981, 399-404.

"Redistributing Incomes: *Ex Ante* or *Ex Post*," *Economic Inquiry*, April 1981, 333-349.

"On the Nonexistence of *Pareto Superior* Outlay Schedules," with J. Panzar, *The Bell Journal of Economics*, Spring 1980, 351-354.

"The Role of Information in the Design of Public Policy Towards Externalities," with R.D. Willig, *Journal of Public Economics*, December 1979, 271-299.

"On the Concept of Optimal Taxation in the Overlapping-Generations Model of Efficient Growth," with E.S. Phelps, *Journal of Public Economics*, August 1979, 1-27.

"Products Liability in Markets With Heterogeneous Consumers," *Journal of Legal Studies*, June 1979, 505-525.

"Costly Litigation and the Tort Law: Single Activity Accidents," *Journal of Legal Studies*, June 1978, 243-261.

"On the Optimal Provision of Journals Qua Excludable Public Goods," with R.D. Willig, *American Economic Review*, June 1978, 324-338.

"Distortionary Wage Differentials in a Two-Sector Growth Model: Some Theorems on Factor Earnings," *International Economic Review*, June 1978, 321-333.

"On the Optimality of Public-Goods Pricing with Exclusion Devices," with W.J. Baumol, *Kyklos*, Fasc. 1, 1977, 5-21.

"Public Good Properties in Reality: The Case of Scientific Journals," with W.J. Baumol, *Proceedings of the ASIS Meetings*, San Francisco, October 1976.

"Merger Illusions and Externalities: A Note," with A. Schotter, *Eastern Economic Review*, November 1976, 19-21.

"Distributive Justice and Optimal Taxation of Wages and Interest in a Growing Economy," *Journal of Public Economics*, January 1976, 139-160.

"Linear Taxation of Wealth and Wages for Intragenerational Lifetime Justice: Some Steady-State Cases," with E.S. Phelps, *American Economic Review*, September 1975, 660-673.

B. Books and Monographs

Proceedings of the Tenth Annual Telecommunications Policy Research Conference, editor with O. Gandy and P. Espinosa, ABLEX Publishers, 1983.

Obstacles to Trade and Competition, with L. Goldberg, OECD, Paris, 1993.

Predatory Pricing, with William Green, *et al.*, American Bar Association, Section of Antitrust Law, Monograph 22, 1996.

Welfare Economics: Readings, editor with W.J. Baumol, Edward Elgar Publishing Ltd. (forthcoming).

C. Book Chapters

"Sustainable Privatization of Latin American Infrastructure: The Role of Law and Regulatory Institutions," with Evamaria Uribe, Chap. in R. D. Willig (ed) (forthcoming, 1999).

"Access and Bundling in High-Technology Markets," with R. D. Willig in (forthcoming, 1999).

"The Harmonization of Competition and Trade Law," with E. Fox, Chap. 15 in L. Waverman, *et al.* (eds.), *Competition Policy in the Global Economy*, Routledge, 1997, 407-439.

"Transition to a Market Economy: Some Industrial Organization Issues," with M. Iwanek, Chap. 7 in H. Kierzkowski, *et al.* (eds.), *Stabilization and Structural Adjustment in Poland*, Routledge, 1993, 133-170.

"Competition Policies for Natural Monopolies in a Developing Market Economy," with Russell Pittman, *Butterworth's Trade and Finance in Central and Eastern Europe*, Butterworth Law Publishers Ltd., 1993, 78-88, Reprinted in *Journal for Shareholders* (published by the Russian Union of Shareholder), Moscow, January 1993, 33-36; *Versenyfelügyeleti Értesítő* (Bulletin of Competition Supervision), Budapest, vol. 3, no. 1-2, January 1993, 30-41; *Narodni Hospodarstvi* (National Economy), Prague; *ICE: Revista de Economia*, No. 736 (December 1994) (in Spanish), 69-90; *USA: Politics, Economics, Ideology*, forthcoming.

"Antitrust: Source of Dynamic and Static Inefficiencies?" with W.J. Baumol, in T. Jorde and D. Teece (eds.), *Antitrust, Innovation, and Competitiveness*, Oxford University Press, 1992, 82-97. Reprinted in "The Journal of Reprints for Antitrust Law and Economics," vol. 26, no. 1 (1996).

"Economic Foundations of Competition Policy: A Review of Recent Contributions," in W. Comanor, *et al.*, *Competition Policy in Europe and North America: Economic Issues and Institutions, Fundamentals of Pure and Applied Economics* (Vol. 43), Harwood Academic Publishers, 1990, 7-42.

"The Department of Justice 1988 Guidelines for International Operations: An Economic Assessment," with A.O. Sykes, in B. Hawk (ed.), *European/American Antitrust and Trade Laws*, Matthew Bender, 1989, 4.1-4.18.

"Predation, Monopolization, and Antitrust," with G. Saloner, in R. Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, vol. 1, North Holland, 1989, 538-596.

"Supervision Technology, Firm Structure, and Employees' Welfare," in *Prices, Competition and Equilibrium*, M. Peston and R.E. Quandt (eds.), Philip Allan Publishers, Ltd., 1986, 142-163.

"Perspectives on Mergers and World Competition," with R.D. Willig, in *Antitrust and Regulation*, R. Grieson (ed.), Lexington Books, 1986, 201-218.

"Transnational Antitrust and Economics," in *Antitrust and Trade Policies in International Trade*, B. Hawk (ed.), Matthew Bender, 1985, 233-248.

"Pricing of Interexchange Access: Some Thoughts on the Third Report and Order in FCC Docket No. 78-72," in *Proceedings of the Eleventh Annual Telecommunications Policy Research Conference*, Vincent Mosco (ed.), ABLEX Publishers, 1984, 145-161.

"Non-Price Anticompetitive Behavior by Dominant Firms Toward the Producers of Complementary Products," with A.O. Sykes and R.D. Willig, in *Antitrust and Regulation: Essays in Memory of John McGowan*, F. Fisher (ed.), MIT Press, 1985, 315-330.

"Local Telephone Pricing in a Competitive Environment," with R.D. Willig, in *Regulating New Telecommunication Networks*, E. Noam (ed.), Harcourt Brace Jovanovich, 1983, 267-289.

"An Economic Definition of Predatory Product Innovation," with R.D. Willig, in *Strategy, Predation and Antitrust Analysis*, S. Salop (ed.), Federal Trade Commission, 1981, 301-396.

"Marginal Cost," in *Encyclopedia of Economics*, D. Greenwald (ed.), McGraw-Hill, 2nd ed. 1994, 627-630.

"Understanding Economic Justice: Some Recent Development in Pure and Applied Welfare Economics," in *Economic Perspectives*, M. Ballabon (ed.) Harwood Academic Publishers, vol. 1, 1979, 51-72.

"Problems of Political Equilibrium in the Soviet Proposals for a European Security Conference," in *Columbia Essays in International Affairs*, Andrew W. Cordier (ed.) Columbia University Press, New York, 1971, 1951-1974.

D. Other Publications

"Predatory Pricing," in Peter Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, MacMillan (forthcoming).

Book review of L. Philips, *Competition Policy: A Game Theoretic Perspective*, reviewed in *Journal of Economic Literature*, vol. 35, No.3, September 1997, 1408-9.

"The Role of Efficiencies in Merger Assessment: The 1997 Guidelines," *Antitrust Report*, September 1997, 10-17.

"Bingaman's Antitrust Era," *Regulation*, vol. 20, No. 2, Spring 1997, 21-26.

"Competition Policy for High-Technology Industries," *International Business Lawyer*, vol. 24, No. 10, November 1996, 479-82.

"Internationalizing Competition Law to Limit Parochial State and Private Action: Moving Towards the Vision of World Welfare," with E.M. Fox, *International Business Lawyer*, vol. 24, No. 10, November 1996, 458-62.

"Economists' View: The Department of Justice Draft for the Licensing and Acquisition of Intellectual Property," *Antitrust*, vol. 9, No. 2, Spring 1995, 29-36.

"Competition Policy During Transformation to a Centrally Planned Economy: A Comment," with R.W. Pittman, in B. Hawk (ed.), *1992 Fordham Corporate Law Institute*, 533-38.

"Poland: The First 1,000 Days and Beyond," *Economic Times*, vol. 3, no. 9, October 1992, 6-7.

"Interview: Janusz A. Ordover: A Merger of Standards? The 1992 Merger Guidelines," *Antitrust*, vol. 6, no. 3, Summer 1992, 12-16.

"Interview: U.S. Justice Department's New Chief Economist: Janusz A. Ordover," *International Merger Law*, no. 14, October 1991.

"Poland: Economy in Transition," *Business Economics*, vol. 26, no. 1, January 1991, 25-30.

"Economic Analysis of Section 337: Protectionism versus Protection of Intellectual Property," with R.D. Willig, in *Technology, Trade and World Competition*, JEIDA Conference Proceedings, Washington, D.C., 1990, 199-232.

"Eastern Europe Needs Antitrust Now," with E. Fox, *New York Law Journal*, November 23, 1990, 1-4.

"Understanding Econometric Methods of Market Definition," with D. Wall, *Antitrust*, vol. 3, no. 3, Summer 1989, 20-25.

"Proving Entry Barriers: A Practical Guide to Economics of Entry," with D. Wall, *Antitrust*, vol. 2, no. 2, Winter 1988, 12-17.

"Proving Predation After Monfort and Matsushita: What the New 'New Learning' has to Offer," with D. Wall, *Antitrust*, vol. 1, no. 3, Summer 1987, 5-11.

"The Costs of the Tort System," with A. Schotter, Economic Policy Paper No. PP-42, New York University, March 1986. Reprinted in *Congressional Record*, U.S. Government Printing Office, Washington, D.C., 1987.

"An Economic Definition of Predation: Pricing and Product Innovation," with R.D. Willig, Report for the Federal Trade Commission, October 1982, 131 pp.

"Market Power and Market Definition," with R.D. Willig, Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, May 1981.

"Herfindahl Concentration Index," with R.D. Willig, Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, March 1981.

"Public Interest Pricing of Scientific and Technical Information," Report for the Department of Commerce Technical Advisory Board, September 1979.

"Economics of Property Rights as Applied to Computer Software and Databases," with Y.M. Braunstein, D.M. Fischer, W.J. Baumol, prepared for the National Commission on New Technological Uses of Copyrighted Works, June 1977, 140 pp. Reprinted in part in *Technology and Copyright*, R.H. Dreyfuss (ed.), Lemond Publications, 1978.

Book review of O. Morgenstern and G.L. Thompson, *Economic Theory of Expanding and Contracting Economies*, reviewed in *Southern Economic Journal*, September 1978.

"Manual of Pricing and Cost Determination for Organizations Engaged in Dissemination of Knowledge," with W.J. Baumol, Y.M. Braunstein, D.M. Fischer, prepared for the Division of Science Information, NSF April 1977, 150 pp.

UNPUBLISHED PAPERS

"Economics, Antitrust and the Motion Picture Industry," C.V. Starr Center Policy Paper, July 1983.

"On Bargaining, Settling, and Litigating: A Problem in Multiperiod Games With Imperfect Information," with A. Rubinstein, C.V. Starr Working Paper, December 1982.

"Supervision and Social Welfare: An Expository Example," C.V. Starr Center Working Paper, January 1982.

"Should We Take Rights Seriously: Economic Analysis of the Family Education Rights Act," with M. Manove, November 1977.

"An Echo or a Choice: Product Variety Under Monopolistic Competition," with A. Weiss; presented at the Bell Laboratories Conference on Market Structures, February 1977.

GRANTS RECEIVED

Regulation and Policy Analysis Program, National Science Foundation, Collaborative Research on Antitrust Policy, Principal Investigator, July 15, 1985 - December 31, 1986.

Regulation of Economic Activity Program, National Science Foundation, Microeconomic Analysis of Antitrust Policy, Principal Investigator, April 1, 1983 - March 31, 1984.

Economics Division of the National Science Foundation, "Political Economy of Taxation," Principal Investigator, Summer 1982.

Sloan Workshop in Applied Microeconomics (coordinator), with W.J. Baumol (Principal Coordinator), September 1977 - August 1982.

Economics Division of the National Science Foundation, "Collaborative Research on the Theory of Optimal Taxation and Tax Reform," July 1979 to September 1980, with E.S. Phelps.

Division of Science Information of the National Science Foundation for Research on "Scale Economies and Public Goods Properties of Information," W.J. Baumol, Y.M. Braunstein, M.I. Nadiri, Fall 1974 to Fall 1977.

National Science Foundation Institutional Grant to New York University for Research on Taxation and Distribution of Income, Summer 1974.

Curriculum Vitae

Name: Robert D. Willig

Address: 220 Ridgeview Road, Princeton, New Jersey 08540

Birth: 1/16/47; Brooklyn, New York

Marital Status: Married, four children

Education: Ph.D. Economics, Stanford University, 1973
Dissertation: Welfare Analysis of Policies
Affecting Prices and Products.
Advisor: James Rosse

M.S. Operations Research, Stanford University, 1968.

A.B. Mathematics, Harvard University, 1967.

Professional Positions:

Professor of Economics and Public Affairs, Princeton University, 1978-.

Principal External Advisor, Infrastructure Program, Inter-American Development Bank, 6/97-8/98.

Deputy Assistant Attorney General, U.S. Department of Justice, 1989-1991.

Supervisor, Economics Research Department, Bell Laboratories, 1977-1978.

Visiting Lecturer (with rank of Associate Professor), Department of Economics and Woodrow Wilson School, Princeton University, 1977-78 (part time).

Economics Research Department, Bell Laboratories, 1973-77.

Lecturer, Economics Department, Stanford University, 1971-73.

Other Professional Activities:

Advisory Board, Electronic Journal of Industrial Organization and Regulation Abstracts, 1996-.

Visiting Faculty Member (occasional), International Program on Privatization and Regulatory Reform, Harvard Institute for International Development, 1996-.

Member, National Research Council Highway Cost Allocation Study Review Committee, 1995-.

Member, Defense Science Board Task Force on the Antitrust Aspects of Defense Industry Consolidation, 1993-94.

Editorial Board, Utilities Policy, 1990-

Leif Johanson Lecturer, University of Oslo, November 1988.

Member, New Jersey Governor's Task Force on Market-Based Pricing of Electricity, 1987-89.

Co-editor, Handbook of Industrial Organization, 1984-89.

Associate Editor, Journal of Industrial Economics, 1984-89.

Director, Consultants in Industry Economics, Inc., 1983-89, 1991-94.

Fellow, Econometric Society, 1981-.

Organizing Committee, Carnegie-Mellon-N.S.F. Conference on Regulation, 1985.

Board of Editors, American Economic Review, 1980-83.

Nominating Committee, American Economic Association, 1980-1981.

Research Advisory Committee, American Enterprise Institute, 1980-1986.

Editorial Board, M.I.T. Press Series on Government Regulation of Economic Activity, 1979-93.

Program Committee, 1980 World Congress of the Econometric Society.

Program Committee, Econometric Society, 1979, 1981, 1985.

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 1981.

Principal Investigator, NSF grant SOC79-0327, 1979-80; NSF grant 285-6041, 1980-82; NSF grant SES-8038866, 1983-84, 1985-86.

Aspen Task Force on the Future of the Postal Service, 1978-80.

Organizing Committee of Sixth Annual Telecommunications Policy Research Conference, 1977-78.

Visiting Fellow, University of Warwick, July 1977.

Institute for Mathematical Studies in the Social Sciences, Stanford University, 1975.

Consulting: Bell Laboratories, 1978-79; AT&T, 1978-89, 1991-; Conrail 1978-87, 1991-97; Federal Trade Commission, 1979-82, 1994-96; Pennsylvania Bell, 1980; Simpson Thatcher Bartlett, 1980, 1993-98; American Association of Railroads, 1981, 1985; Math-tech, 1981; Union Pacific Railroad, 1981, 1995-; Family Lines Rail System, 1982; Pepper, Hamilton, and Scheetz, 1981-87, 1991-98; Siemens Corp., 1982; Board of Governors of U. S. Postal Service, 1981; OECD, 1983-85, 1991-95; Sidley & Austin, 1983-89, 1991-98; U.S. Postal Service, 1983-84; Echlin Inc., 1982-83; United Airlines, 1983, 1991-98; Consultants in Industry Economics, 1983-89, 1991-; Wiley, Malehorn & Sirota, 1983-89; City of Newark, 1984; Arnold & Porter, 1986-89, 1991-; Howrey & Simon, 1985-88, 1993-; Kodak, 1987-89; Crowell & Moring, 1988; Viacom 1989, 1991-98; Bell Atlantic, 1991-94; Intel, 1991-93; AOPL, 1993; IBM, 1993-96; Merck, 1993-1995; Harkins Cunningham, 1993-96; Boeing, 1993-98; Niagra Mohawk, 1994; PSE&G, 1994-1996; Microsoft, 1994; Coca-Cola Co., 1994-; Digital Equipment Corp. 1997-98; World Bank 1994-; Inter-American Development Bank, 1997-; Air Transport Association of America, 1998.

Published Articles and Book Chapters:

"Economic Principles to Guide Post-Privatization Governance," forthcoming in Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

"Access and Bundling in High-Technology Markets," (with J. A. Ordover), forthcoming in Competition, Convergence and the Microsoft Monopoly, T. Lenard editor.

"Competitive Rail Regulation Rules: Should Price Ceilings Constrain Final Products or Inputs?," (With W. J. Baumol), Journal of Transport Economics and Policy, Vol. 33, Part 1, pp. 1-11.

"Economic Effects of Antidumping Policy," Brookings Trade Forum: 1998, 19-41.

"Consumer's Surplus Without Apology," reprinted in Readings in Microeconomic Theory, M. M. La Manna (ed.), Dryden Press, 1997, pp. 201-212.

"Interview With Economist Robert D. Willig," Antitrust , Vol. 11, No. 2, Spring 1997, pp. 11-15.

"Parity Pricing and its Critics: A Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," (with W. J. Baumol and J. A. Ordover), Yale Journal on Regulation, Vol. 14, No. 1, Winter 1997, pp. 145-164.

"Restructuring Regulation of the Rail Industry," (with Ioannis Kessides), in Private Sector, Quarterly No. 4, September 1995, pp. 5 - 8. Reprinted in Viewpoint, October, 1995, The World Bank. Reprinted in Private Sector, special edition: Infrastructure, June 1996.

"Competition and Regulation in the Railroad Industry," (with Ioannis Kessides), in Regulatory Policies and Reform: A Comparative Perspective, C. Frischtak (ed.), World Bank, 1996.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), reprinted in The Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 95-130.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), reprinted in The Political Economy of Privatization and Deregulation, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 245-260.

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Invited Conference Presentations:

Economic Development Institute of the World Bank -- Program on Competition Policy

"Policy Towards Horizontal Mergers" 1998

Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of Justice

"Market Definition in Antitrust Analysis" 1998

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance

"Infrastructure Architecture and Regulation: Railroads" 1998

EU Committee Competition Conference – Market Power

"US/EC Perspective on Market Definition" 1998

Federal Trade Commission Roundtable

"Antitrust Policy for Joint Ventures" 1998

1998 Antitrust Conference

"Communications Mergers" 1998

The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly

"Access and Bundling in High-Technology Markets" 1998

FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation

"The Role of Economic Evidence and Testimony" 1997

FTC Hearings on Classical Market Power in Joint Ventures

"Microeconomic Analysis and Guidelines" 1997

World Bank Economists' Week IV "Making Markets More Effective With Competition Policy"	1997
Brookings Trade Policy Forum "Competition Policy and Antidumping: The Economic Effects"	1997
University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020 "Microeconomics, Privatization, and Vertical Integration"	1997
ABA Section of Antitrust Law Conference on The Telecommunications Industry "Current Economic Issues in Telecommunications"	1997
Antitrust 1998: The Annual Briefing "The Re-Emergence of Distribution Issues"	1997
Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean "Economic Principles to Guide Post-Privatization Governance"	1997
Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East "Privatization: Methods and Pricing Issues"	1997
American Enterprise Institute for Public Policy Research Conference "Discussion of Local Competition and Legal Culture"	1997
Harvard Program on Global Reform and Privatization of Public Enterprises "Infrastructure Privatization and Regulation: Freight"	1997
World Bank Competition Policy Workshop "Competition Policy for Entrepreneurship and Growth"	1997
Eastern Economics Association Paul Samuelson Lecture "Bottleneck Access in Regulation and Competition Policy"	1997
ABA Annual Meeting, Section of Antitrust Law "Antitrust in the 21st Century: The Efficiencies Guidelines"	1997
Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities "Regulation: Theoretical Context and Advantages vs. Disadvantages"	1997

The FCC: New Priorities and Future Directions "Competition in the Telecommunications Industry"	1997
American Enterprise Institute Studies in Telecommunications Deregulation "The Scope of Competition in Telecommunications"	1996
George Mason Law Review Symposium on Antitrust in the Information Revolution "Introduction to the Economic Theory of Antitrust and Information"	1996
Korean Telecommunications Public Lecture "Market Opening and Fair Competition"	1996
Korea Telecommunications Forum "Desirable Interconnection Policy in a Competitive Market"	1996
European Association for Research in Industrial Economics Annual Conference "Bottleneck Access: Regulation and Competition Policy"	1996
Harvard Program on Global Reform and Privatization of Public Enterprises "Railroad and Other Infrastructure Privatization"	1996
FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry "The Scope of Telecommunications Competition"	1996
Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection "The Economics of Interconnection"	1996
World Bank Seminar on Experiences with Corporatization "Strategic Directions of Privatization"	1996
FCC Economic Forum on the Economics of Interconnection "Lessons from Other Industries"	1996
ABA Annual Meeting, Section of Antitrust Law "The Integration, Disintegration, and Reintegration of the Entertainment Industry"	1996
Conference Board: 1996 Antitrust Conference "How Economics Influences Antitrust and Vice Versa"	1996
Antitrust 1996: A Special Briefing "Joint Ventures and Strategic Alliances"	1996

New York State Bar Association Section of Antitrust Law Winter Meeting "Commentary on Horizontal Effects Issues"	1996
FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age "Vertical Issues for Networks and Standards"	1995
Wharton Seminar on Applied Microeconomics "Access Policies with Imperfect Regulation"	1995
Antitrust 1996, Washington D.C. "Assessing Joint Ventures for Diminution of Competition"	1995
ABA Annual Meeting, Section of Antitrust Law "Refusals to Deal -- Economic Tests for Competitive Harm"	1995
FTC Seminar on Antitrust Enforcement Analysis "Diagnosing Collusion Possibilities"	1995
Philadelphia Bar Education Center: Antitrust Fundamentals "Antitrust--The Underlying Economics"	1995
Vanderbilt University Conference on Financial Markets "Why Do Christie and Schultz Infer Collusion From Their Data?"	1995
ABA Section of Antitrust Law Chair's Showcase Program "Discussion of Telecommunications Competition Policy"	1995
Conference Board: 1995 Antitrust Conference "Analysis of Mergers and Joint Ventures"	1995
ABA Conference on The New Antitrust: Policy of the '90s "Antitrust on the Super Highways/Super Airways"	1994
ITC Hearings on The Economic Effects of Outstanding Title VII Orders "The Economic Impacts of Antidumping Policies"	1994
OECD Working Conference on Trade and Competition Policy "Empirical Evidence on The Nature of Anti-dumping Actions"	1994
Antitrust 1995, Washington D.C. "Rigorous Antitrust Standards for Distribution Arrangements"	1994

ABA -- Georgetown Law Center: Post Chicago-Economics: New Theories - New Cases?	
"Economic Foundations for Vertical Merger Guidelines"	1994
Conference Board: Antitrust Issues in Today's Economy	
"New Democrats, Old Agencies: Competition Law and Policy"	1994
Federal Reserve Board Distinguished Economist Series	
"Regulated Private Enterprise Versus Public Enterprise"	1994
Institut d'Etudes Politiques de Paris	
"Lectures on Competition Policy and Privatization"	1993
Canadian Bureau of Competition Policy Academic Seminar Series, Toronto.	
"Public Versus Regulated Private Enterprise"	1993
CEPS Symposium on The Clinton Administration: A Preliminary Report Card	
"Policy Towards Business"	1993
Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY	
"Discussion of Deregulation of Networks: What Has Worked and What Hasn't"	1993
World Bank Annual Conference on Development Economics	
"Public Versus Regulated Private Enterprise"	1993
Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process, Santa Fe, NM	
"The Economics of Current Issues in Telecommunications Regulation"	1992
"The Role of Markets in Presently Regulated Industries"	1992
The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY	
"Antitrust in the Global Economy"	1992
"Monopoly Issues for the '90s"	1993
Columbia University Seminar on Applied Economic Theory, New York, NY	
"Economic Rationales for the Scope of Privatization"	1992
Howrey & Simon Conference on Antitrust Developments, Washington, DC	
"Competitive Effects of Concern in the Merger Guidelines"	1992

Arnold & Porter Colloquium on Merger Enforcement, Washington, DC "The Economic Foundations of the Merger Guidelines"	1992
American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA "Applying the 1992 Merger Guidelines"	1992
OECD Competition Policy Meeting, Paris, France "The Economic Impacts of Antidumping Policy"	1992
Center for Public Choice Lecture Series, George Mason University Arlington, VA "The Economic Impacts of Antidumping Policy"	1992
Brookings Institution Microeconomics Panel, Washington, DC, "Discussion of the Evolution of Industry Structure"	1992
AT&T Conference on Antitrust Essentials "Antitrust Standards for Mergers and Joint Ventures"	1991
ABA Institute on The Cutting Edge of Antitrust: Market Power "Assessing and Proving Market Power: Barriers to Entry"	1991
Second Annual Workshop of the Competition Law and Policy Institute of New Zealand "Merger Analysis, Industrial Organization Theory, and Merger Guidelines"	1991
"Exclusive Dealing and the <u>Fisher & Paykel</u> Case"	1991
Special Seminar of the New Zealand Treasury "Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly"	1991
Public Seminar of the Australian Trade Practices Commission "Antitrust Issues of the 1990's"	1991
National Association of Attorneys General Antitrust Seminar "Antitrust Economics"	1991
District of Columbia Bar's 1991 Annual Convention "Administrative and Judicial Trends in Federal Antitrust Enforcement"	1991
ABA Spring Meeting "Antitrust Lessons From the Airline Industry"	1991

Conference on The Transition to a Market Economy - Institutional Aspects "Anti-Monopoly Policies and Institutions"	1991
Conference Board's Thirtieth Antitrust Conference "Antitrust Issues in Today's Economy"	1991
American Association for the Advancement of Science Annual Meeting "Methodologies for Economic Analysis of Mergers"	1991
General Seminar, Johns Hopkins University "Economic Rationales for the Scope of Privatization"	1991
Capitol Economics Speakers Series "Economics of Merger Guidelines"	1991
CRA Conference on Antitrust Issues in Regulated Industries "Enforcement Priorities and Economic Principles"	1990
Pepper Hamilton & Scheetz Anniversary Colloquium "New Developments in Antitrust Economics"	1990
PLI Program on Federal Antitrust Enforcement in the 90's "The Antitrust Agenda of the 90's"	1990
FTC Distinguished Speakers Seminar "The Evolving Merger Guidelines"	1990
The World Bank Speakers Series "The Role of Antitrust Policy in an Open Economy"	1990
Seminar of the Secretary of Commerce and Industrial Development of Mexico "Transitions to a Market Economy"	1990
Southern Economics Association "Entry in Antitrust Analysis of Mergers"	1990
"Discussion of Strategic Investment and Timing of Entry"	1990
American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries "Discussion of Network Problems and Solutions"	1990

American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition	
"Law and Economics Framework for Analysis"	1990
Banco Nacional de Desenvolvimento Economico Social Lecture	
"Competition Policy: Harnessing Private Interests for the Public Interest"	1990
Western Economics Association Annual Meetings	
"New Directions in Antitrust from a New Administration"	1990
"New Directions in Merger Enforcement: The View from Washington"	1990
Woodrow Wilson School Alumni Colloquium	
"Microeconomic Policy Analysis and Antitrust--Washington 1990"	1990
Arnold & Porter Lecture Series	
"Advocating Competition"	1991
"Antitrust Enforcement"	1990
ABA Antitrust Section Convention	
"Recent Developments in Market Definition and Merger Analysis"	1990
Federal Bar Association	
"Joint Production Legislation: Competitive Necessity or Cartel Shield?"	1990
Pew Charitable Trusts Conference	
"Economics and National Security"	1990
ABA Antitrust Section Midwinter Council Meeting	
"Fine-tuning the Merger Guidelines"	1990
"The State of the Antitrust Division"	1991
International Telecommunications Society Conference	
"Discussion of the Impact of Telecommunications in the UK"	1989
The Economists of New Jersey Conference	
"Recent Perspectives on Regulation"	1989
Conference on Current Issues Challenging the Regulatory Process	
"Innovative Pricing and Regulatory Reform"	1989
"Competitive Wheeling"	1989
Conference Board: Antitrust Issues in Today's Economy	
"Foreign Trade Issues and Antitrust"	1989

McKinsey & Co. Mini-MBA Conference	
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior"	1989
	1994
Olin Conference on Regulatory Mechanism Design	
"Revolutions in Regulatory Theory and Practice: Exploring The Gap"	1989
University of Dundee Conference on Industrial Organization and Strategic Behavior	
"Mergers in Differentiated Product Industries"	1988
Leif Johanson Lectures at the University of Oslo	
"Normative Issues in Industrial Organization"	1988
Mergers and Competitiveness: Spain Facing the EEC	
"Merger Policy"	1988
"R&D Joint Ventures"	1988
New Dimensions in Pricing Electricity	
"Competitive Pricing and Regulatory Reform"	1988
Program for Integrating Economics and National Security: Second Annual Colloquium	
"Arming Decisions Under Asymmetric Information"	1988
European Association for Research in Industrial Economics	
"U.S. Railroad Deregulation and the Public Interest"	1987
"Economic Rationales for the Scope of Privatization"	1989
"Discussion of Licensing of Innovations"	1990
Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change	
"Discussion of Regulatory Mechanism Design in the Presence of Research, Innovation, and Spillover Effects"	1987
Special Brookings Papers Meeting	
"Discussion of Empirical Approaches to Strategic Behavior"	1987
"New Merger Guidelines"	1990
Deregulation or Regulation for Telecommunications in the 1990's	
"How Effective are State and Federal Regulations?"	1987

Conference Board Roundtable on Antitrust	
"Research and Production Joint Ventures"	1990
"Intellectual Property and Antitrust"	1987
Current Issues in Telephone Regulation	
"Economic Approaches to Market Dominance: Applicability of Contestable Markets"	1987
Harvard Business School Forum on Telecommunications	
"Regulation of Information Services"	1987
The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market	
"Why Reinvent the Wheel?"	1986
World Bank Seminar on Frontiers of Economics	
"What Every Economist Should Know About Contestable Markets"	1986
Bell Communications Research Conference on Regulation and Information	
"Fuzzy Regulatory Rules"	1986
Karl Eller Center Forum on Telecommunications	
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation"	1986
Railroad Accounting Principles Board Colloquium	
"Contestable Market Theory and ICC Regulation"	1986
Canadian Embassy Conference on Current Issues in Canadian -- U.S. Trade and Investment	
"Regulatory Revolution in the Infrastructure Industries"	1985
Eagleton Institute Conference on Telecommunications in Transition	
"Industry in Transition: Economic and Public Policy Overview"	1985
Brown University Citicorp Lecture	
"Logic of Regulation and Deregulation"	1985
Columbia University Communications Research Forum	
"Long Distance Competition Policy"	1985
American Enterprise Institute Public Policy Week	
"The Political Economy of Regulatory Reform"	1984

MIT Communications Forum "Deregulation of AT&T Communications"	1984
Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference "Potential Uses of The File"	1984
Federal Bar Association Symposium on Joint Ventures "The Economics of Joint Venture Assessment"	1984
Hoover Institute Conference on Antitrust "Antitrust for High-Technology Industries"	1984
NSF Workshop on Predation and Industrial Targeting "Current Economic Analysis of Predatory Practices"	1983
The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future "Contestability As A Guide for Regulation and Deregulation"	1984
University of Pennsylvania Economics Day Symposium "Contestability and Competition: Guides for Regulation and Deregulation"	1984
Pinhas Sapir Conference on Economic Policy in Theory and Practice "Corporate Governance and Market Structure"	1984
Centre of Planning and Economic Research of Greece "Issues About Industrial Deregulation"	1984
	"Contestability: New Research Agenda" 1984
Hebrew and Tel Aviv Universities Conference on Public Economics "Social Welfare Dominance Extended and Applied to Excise Taxation"	1983
NBER Conference on Industrial Organization and International Trade "Perspectives on Horizontal Mergers in World Markets"	1983
Workshop on Local Access: Strategies for Public Policy "Market Structure and Government Intervention in Access Markets"	1982
NBER Conference on Strategic Behavior and International Trade "Industrial Strategy with Committed Firms: Discussion"	1982

Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks	
"Local Pricing in a Competitive Environment"	1982
International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure	
"Theory of Contestability"	1982
"Product Development, Investment, and the Evolution of Market Structures"	1982
N.Y.U. Conference on Competition and World Markets: Law and Economics	
"Competition and Trade Policy--International Predation"	1982
CNRS-ISPE-NBER Conference on the Taxation of Capital	
"Welfare Effects of Investment Under Imperfect Competition"	1982
Internationales Institut für Management und Verwaltung Regulation Conference	
"Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies"	1981
NBER-Kellogg Graduate School of Management Conference on the Econometrics of Market Models with Imperfect Competition	
"Discussion of Measurement of Monopoly Behavior: An Application to the Cigarette Industry"	1981
The Peterkin Lecture at Rice University	
"Deregulation: Ideology or Logic?"	1981
FTC Seminar on Antitrust Analysis	
"Viewpoints on Horizontal Mergers"	1982
"Predation as a Tactical Inducement for Exit"	1980
NBER Conference on Industrial Organization and Public Policy	
"An Economic Definition of Predation"	1980
The Center for Advanced Studies in Managerial Economics Conference on The Economics of Telecommunication	
"Pricing Local Service as an Input"	1980
Aspen Institute Conference on the Future of the Postal Service	
"Welfare Economics of Postal Pricing"	1979
Department of Justice Antitrust Seminar	
"The Industry Performance Gradient Index"	1979

Eastern Economic Association Convention	
"The Social Performance of Deregulated Markets for Telecommunications Services"	
Industry Workshop Association Convention	
"Customer Equity and Local Measured Service"	1979
Symposium on Ratemaking Problems of Regulated Industries	
"Pricing Decisions and the Regulatory Process"	1979
Woodrow Wilson School Alumni Conference	
"The Push for Deregulation"	1979
NBER Conference on Industrial Organization	
"Intertemporal Sustainability"	1979
World Congress of the Econometric Society	
"Theoretical Industrial Organization"	1980
Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation	
"Network Access Pricing"	1978
ALI-ABA Conference on the Economics of Antitrust	
"Predatoriness and Discriminatory Pricing"	1978
AEI Conference on Postal Service Issues	
"What Can Markets Control?"	1978
University of Virginia Conference on the Economics of Regulation	
"Public Interest Pricing"	1978
DRI Utility Conference	
"Marginal Cost Pricing in the Utility Industry: Impact and Analysis"	1978
International Meeting of the Institute of Management Sciences	
"The Envelope Theorem"	1977
University of Warwick Workshop on Oligopoly	
"Industry Performance Gradient Indexes"	1977
North American Econometric Society Convention	
"Intertemporal Sustainability"	1979
"Social Welfare Dominance"	1978
"Economies of Scope, DAIC, and Markets with Joint Production"	1977

Telecommunications Policy Research Conference	
"Transition to Competitive Markets"	1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition"	1985
"Market Power in The Telecommunications Industry"	1984
"FCC Policy on Local Access Pricing"	1983
"Do We Need a Regulatory Safety Net in Telecommunications?"	1982
"Anticompetitive Vertical Conduct"	1981
"Electronic Mail and Postal Pricing"	1980
"Monopoly, Competition and Efficiency": Chairman	1979
"A Common Carrier Research Agenda"	1978
"Empirical Views of Ramsey Optimal Telephone Pricing"	1977
"Recent Research on Regulated Market Structure"	1976
"Some General Equilibrium Views of Optimal Pricing"	1975
National Bureau of Economic Research Conference on Theoretical Industrial Organization	
Discussion of "Compensating Variation as a Measure of Welfare Change"	1976
Conference on Pricing in Regulated Industries: Theory & Application	
"Ramsey Optimal Pricing of Long Distance Telephone Services"	1977
NBER Conference on Public Regulation	
"Income Distributional Concerns in Regulatory Policy-Making"	1977
Allied Social Science Associations National Convention	
"Merger Guidelines and Economic Theory"	1990
Discussion of "Competitive Rules for Joint Ventures"	1989
"New Schools in Industrial Organization"	1988
"Industry Economic Analysis in the Legal Arena"	1987
"Transportation Deregulation"	1984
Discussion of "Pricing and Costing of Telecommunications Services"	1983
Discussion of "An Exact Welfare Measure"	1982
"Optimal Deregulation of Telephone Services"	1982
"Sector Differentiated Capital Taxes"	1981
"Economies of Scope"	1980
"Social Welfare Dominance"	1980
"The Economic Definition of Predation"	1979
Discussion of "Lifeline Rates, Succor or Snare?"	1979
"Multiproduct Technology and Market Structure"	1978
"The Economic Gradient Method"	1978
"Methods for Public Interest Pricing"	1977
Discussion of "The Welfare Implications of New Financial Instruments"	1976
"Welfare Theory of Concentration Indices"	1976

Discussion of "Developments in Monopolistic Competition Theory"	1976
"Hedonic Price Adjustments"	1975
"Public Good Attributes of Information and its Optimal Pricing"	1975
"Risk Invariance and Ordinally Additive Utility Functions"	1974
"Consumer's Surplus: A Rigorous Cookbook"	1974
University of Chicago Symposium on the Economics of Regulated Public Utilities	
"Optimal Prices for Public Purposes"	1976
American Society for Information Science	
"The Social Value of Information: An Economist's View"	1975
Institute for Mathematical Studies in the Social Sciences Summer Seminar	
"The Sustainability of Natural Monopoly"	1975
U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services	
"The Evaluation of the Economic Benefits of Productive Information"	1975
NYU-Columbia Symposium on Regulated Industries	
"Ramsey Optimal Public Utility Pricing"	1975

Research Seminars:

Bell Communications Research (2)	University of California, San Diego
Bell Laboratories (numerous)	University of Chicago
Department of Justice (3)	University of Delaware
Electric Power Research Institute	University of Florida
Federal Reserve Board	University of Illinois
Federal Trade Commission (4)	University of Iowa (2)
Mathematica	Universite Laval
Rand	University of Maryland
World Bank (3)	University of Michigan
Carleton University	University of Minnesota
Carnegie-Mellon University	University of Oslo
Columbia University (4)	University of Pennsylvania (3)

Cornell University (2)
Georgetown University
Harvard University (2)
Hebrew University
Johns Hopkins University (2)
M. I. T. (4)
New York University (4)
Northwestern University (2)
Norwegian School of Economics and
Business Administration

University of Toronto
University of Virginia
University of Wisconsin
University of Wyoming
Vanderbilt University
Yale University (2)
Princeton University (many)
Rice University
Stanford University (5)
S.U.N.Y. Albany

EXHIBIT B

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Petition of Ameritech for Forbearance from) CC Docket No. 99-65
Dominant Carrier Regulation of its)
Provision of High Capacity Services in the)
Chicago LATA)

DECLARATION OF BRUCE BENNETT

Pursuant 28 U.S.C. § 1746, I, Bruce Bennett, declare as follows:

I. BACKGROUND AND ASSIGNMENT

1. My name is Bruce Bennett. I hold the position of Director of Product Delivery in AT&T's Local Service Organization in Chicago. In this capacity, I am responsible for negotiating and implementing interconnection arrangements, including collocation arrangements, with incumbent local exchange carriers ("LECs") such as Ameritech.

2. I received my Bachelor of Arts degree in Finance from Michigan State University in 1979 and a Master of Business Administration degree from Wayne State University in 1983. I joined Michigan Bell in 1979. At divestiture I joined AT&T in the State Pricing organization in Michigan. In 1986, I was assigned to AT&T's Marketing Plans Implementation Organization in Chicago and had assignments that included work on Alternative Regulation plans, access charges and new services introduction. In 1990, I was transferred to Wisconsin and

became AT&T's principal spokesperson with the Wisconsin Commission. I moved to Chicago in early 1996 and assumed the position of AT&T's Chief Regulatory Advocate for the Central Region. I was assigned my present responsibilities in 1997.

3. I have been asked to address claims made by Ameritech through its expert Dr. Aron regarding the ability of new entrants to use collocation arrangements in order to compete with Ameritech in providing special access services. As I explain below, Dr. Aron misunderstands the role collocation plays in providing special access services, and consequently, greatly overestimates the level of competition Ameritech faces for special access and related services.

II. THE COLLOCATION EVIDENCE CITED BY DR. ARON IN FACT DEMONSTRATES AMERITECH'S MONOPOLY POWER IN THE SPECIAL ACCESS MARKET

4. Dr. Aron asserts that Ameritech's high market share in the special access market does not raise competitive concerns because "evidence on collocation demonstrates that competitors already have facilities in place to serve a substantial majority of Ameritech's switched access minutes, including those in the suburbs." Aron Report at 22. More specifically, Dr. Aron concludes that entry barriers are low and that new entrants "impose significant competitive pressures on Ameritech" from the purported fact that these entrants have established collocation arrangements with wire centers that are associated with

69.1 percent of switched access minutes in the Chicago LATA. *Id.* at 22, 27.¹

The reality, however, is that far from demonstrating that Ameritech lacks market power, these high levels of collocation are direct evidence that Ameritech has such power. If, in fact, there was significant competition for special access, there would be little or no collocation in existence. Competitors would have built facilities all the way to customer locations, eliminating the need to collocate.

5. Special access connects a high volume customer directly from its premises to a long distance carrier's point of presence ("POP").² Provisioning of special access services require two basic components: dedicated local distribution channels ("LDCs") and dedicated transport. LDCs are the facilities that connect the customer premises to a local serving office ("LSO"); dedicated transport facilities carry calls from the LSO to the long distance carrier's POP. In practice, control over either critical component means control over the price of special access services.

6. Although AT&T and others have begun to deploy facilities to provide the direct transport component of some high capacity service in some urban areas of Ameritech's region, new entrants remain heavily dependent on Ameritech's LDC facilities (and for a vast majority of customers, on Ameritech's ubiquitous

¹ Dr. Aron, however, does not provide any backup as to how she derived the extent of collocation in the Chicago LATA other than to say it is based on "[d]ata provided by Ameritech." *Id.* at 27 n.61.

² The POP is the interconnection point between the local network and the long distance network.

transport facilities as well). As explained in the accompanying Declaration of Mr. Timothy Rowland, there are substantial entry barriers to the provision of competing LDCs. In fact, AT&T cannot directly connect its transport network to many buildings in Chicago because the buildings are either too far away from AT&T's network or the buildings cannot accommodate the facilities AT&T would need to install. In fact, this latter situation occurs quite often because many buildings have room for only one set of facilities and the buildings have already been utilized by Ameritech.

7. Thus, in the many instances where AT&T cannot connect directly to the customer, it must have access to the "last mile" of wire—*i.e.*, Ameritech's LDCs. And it is precisely this function that the collocation arrangements referred to by Dr. Aron are used to perform. Collocation allows AT&T to connect customers served by Ameritech's LDCs to AT&T's dedicated transport thereby providing special access. Accordingly, the collocation figures cited by Dr. Aron, if anything, confirm Ameritech's bottleneck control over the vast majority of LDCs even in the Chicago MSA. In this context, AT&T and other new entrants collocate in Ameritech offices because they have to do so to get access to the Ameritech LDCs for which there are no competitive alternative.

III. AMERITECH HAS DISCRIMINATED AGAINST AT&T IN ORDER TO FORECLOSE COMPETITION FOR SPECIAL ACCESS SERVICES

8. Dr. Aron also overstates the effectiveness of collocation arrangements even as to competition for dedicated transport. Dr. Aron is simply wrong, when she

simplistically asserts, Aron Report at 26-27, that the fact that a central office is collocated means that Ameritech is subject to competition for the provisioning of the transport component of access. Tellingly, Dr. Aron does not claim that dedicated transport is occurring in each of the Ameritech central offices in which competitors have purportedly collocated. Nor could she. In order to provide dedicated transport in a collocated central office, a new entrant must install very expensive electronic equipment to connect Ameritech's LDCs to its transport facilities. This only makes sense where the central office serves sufficient high volume special access customers to make this substantial investment worthwhile.³

9. Even beyond these problems, in any collocation arrangement, AT&T is totally dependent upon Ameritech's cooperation in order to provide service—there are no other alternative suppliers to which AT&T can turn. To date, however, Ameritech has used its dominant position and insisted on patently unreasonable terms and conditions that have delayed AT&T's ability to provide competitive transport services, driving up the costs of these services. And even when Ameritech ultimately retreats from the imposition of discriminatory terms and conditions, AT&T is still placed at a significant competitive disadvantage. Because Ameritech already has in place a ubiquitous network, it can provide service to a customer instantly. By contrast, AT&T's competing service is much less attractive if the customer must endure significant delays before service can be

³ It is also the case, of course, that the transport facilities themselves (and the necessary rights-of-way) are very expensive and time consuming to build.

provided or if the quality of AT&T's service is degraded because of artificial and discriminatory constraints on the equipment AT&T can use to provide service.⁴

10. Ameritech has significantly delayed new entrants' ability to enter the market and serve their customers in a competitive fashion by manufacturing issues which require significant amounts of time and resources to resolve. For example, Ameritech refused to permit AT&T to collocate a DACS, a device that is used to provide electronic digital cross-connections. The use of a DACS—which uses digital technology to cross-connect DS1 facilities—greatly enhances the efficiency of the provisioning and exchange of traffic between AT&T and Ameritech because it performs provisioning cross connections electronically and remotely—*i.e.*, without the need for manually running jumpers on a frame by dispatching a person to the collocation space. Ameritech, however, claimed that the DACS is a “switch” forbidden by the terms of the AT&T-Ameritech Interconnection Agreement. See Letter from Wayne Astor to Steve Hunsberger (Sep. 15, 1997) (attached hereto as Exhibit 1). It was clearly the intent of the

⁴ To be sure, the Commission's forthcoming collocation rules should help facilitate competition by eliminating the ability of incumbent LECs' to impose many unreasonable terms and conditions on new entrants. However, AT&T's *existing* collocation arrangements with Ameritech contain such unreasonable terms and conditions and it will obviously take some time before AT&T can utilize the Commission's new rules to have them eliminated. Moreover, no set of rules can alter the basic fact that incumbents can competitively benefit from delay. Thus, incumbents can impede competition by simply refusing to provide the type of collocation arrangements required by the Commission's rules and forcing new entrants to engage in costly and protracted litigation to obtain the benefit of those rules. In fact, Ameritech engaged in exactly this tactic with regard to the provisioning of shared transport.

Interconnection Agreement to refer to circuit switches such as the Northern DMS switches and the Lucent 5ESS and not to cross connect devices.

11. Likewise, Ameritech refused to permit AT&T to collocate Lucent FT-2000 multiplexers on fire and electro-magnetic interference (“EMI”) “safety” grounds, despite the fact that these devices were used by other RBOCs and have been widely and safely deployed for over seven years. *See* Correspondence attached at Exhibit 2. Indeed, even after additional fire testing was performed, Ameritech insisted on an Ameritech EMI “requirement” that even the equipment used by Ameritech did not meet. Even if Ameritech ultimately retreats from these indefensible positions, it has succeeded in greatly delaying AT&T’s ability to provide service and significantly increasing AT&T’s costs by forcing it to expend considerable resources to rebut Ameritech’s baseless claims.
12. Ameritech has also attempted to block competition by assessing collocation charges that are patently above cost. More precisely, Ameritech’s physical collocation product includes certain activities for which it assesses “extraordinary charges” even though this work is necessary for collocation. Examples include Ameritech’s charges for wall removal, asbestos removal and core drilling of floors and walls. For these extraordinary charges, Ameritech has required AT&T to pay a markup of **100 percent** over the actual level of cost. *See, e.g.*, Letter from Laura Shalloo to Wayne Astor (July 14, 1997); Cost Estimate, AON 244502733 (July 16, 1997) at 4 Cost Estimate, AON 2445195332 (July 7, 1997)

at 4 (attached hereto as Exhibit 3). This excessively high markup is discriminatory and forecloses competition.

IV. CONCLUSION

13. In sum, the evidence of collocation relied upon by Dr. Aron in fact demonstrates that Ameritech controls the essential facilities necessary to connect directly to special access customers. Moreover, Dr. Aron overstates the effectiveness of collocation even as to competition for the dedicated transport component of special access. AT&T and other new competitors must rely on the cooperation of Ameritech to collocate, but Ameritech has taken advantage of this fact to impose discriminatory terms and conditions on parties wishing to collocate in its central offices. The result is that collocation is far less than an effective mechanism for promoting exchange access competition.

I declare under penalty of perjury under the laws of the United States that
the foregoing is true and correct. Executed on March 25, 1999.

A handwritten signature in cursive script, reading "Bruce C. Bennett". The signature is written in black ink and features a prominent, sweeping flourish that extends to the right and then curves back down towards the end of the name.

Bruce C. Bennett