geographically and by category of subscriber—to another. Making these distinctions requires recourse to market definitions that are familiar to the Commission.

35. On the demand side, medium and large business customers are clearly in a market distinct from smaller customers: they demand different kinds of service, only very imperfectly or not at all substitutable one for the other. Looking to the supply side: CLECs have until now targeted metropolitan—and, at the other extreme, avoided rural—areas[25]; and this behavior would be unlikely to be altered by changes in the relative prices of the dimensions ordinarily used to define markets. Manifestly, while the loops may well be categorized as essential in the latter customer and geographic markets, they are not in the former. The UNE Fact Report and the PNR Report have provided detailed assessments of the activities of CLECs nationally and

[25] Timothy J. Tardiff and I recently developed substantially the same market definition in our analyses of high capacity competition in Phoenix and Seattle. Kahn and Tardiff, "Economic Evaluation of High Capacity Competition in Phoenix," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Phoenix, Arizona MSA, August 14, 1998 and "Economic Evaluation of High Capacity Competition in Seattle," prepared for filing with the Federal Communications Commission on behalf of US WEST Communications, Petition of US WEST Communications for Forbearance from Regulation as a Dominant Carrier in the Seattle, Washington MSA, December 22, 1998: The fact that the relevant product market is narrower than...all-local-exchange-services...is richly illustrated by the fact that competition has...concentrated on the business market—and in particular, service to large businesses in concentrated metropolitan....As AT&T clearly proclaimed upon completion of its recent acquisition of Teleport Communications, which greatly strengthened its potential market position in the offer of exchange access:

> 'Completion of this merger accelerates our entry into the $21 billion business local service market because we're reducing our dependence on the Bell Companies for direct connections to businesses,' said AT&T Chairman C. Michael Armstrong....'We're giving customers simplicity, convenience and choice. It's one-stop shopping for local and long-distance service, just for starters,' he said.

AT&T Completes TCG Merger; TCG Now Core of AT&T Local Services Network Unit, AT&T News Release, July 23, 1998.

The Release went on to describe how the TCG acquisition facilitates its offer of Digital Link service, an arrangement that employs high capacity links to business customers. Manifestly AT&T views business services as separate from residential. Similarly, MCI WorldCom recently announced a marketing initiative that targets offerings to *business* customers combining local, long-distance, voice, and data services. *MCI WorldCom Sets Major Marketing Plan for Business Clients*, WALL ST. J., Sept. 29, 1998, at C13.

descriptions of the presence of their facilities in selected metropolitan areas, both of which facilitate economic analyses of these several markets.[26]

36. With regard to the subscriber loops required to serve medium to large businesses in metropolitan areas, the facts are:

- At least five facilities-based CLECs are present in each of the top 30 metropolitan statistical areas (MSAs),[27] and at least one in all but one of the top 150 MSAs.
- CLECs are already serving large numbers of business customers in these areas and their sales have been growing at a rapid rate. CLEC facilities already serve 15 percent of all commercial buildings in the United States and considerably more volume is within their reach.[28]
- CLECs are already very successful in capturing market share with their own facilities in these targeted areas. The UNE Fact Report presents alternative estimates of CLEC-provided local loops that imply market shares of between 8 and 18 percent in targeted geographic areas.[29]

[26] The UNE Fact Report provides geographic detail for Los Angeles, San Diego, San Jose, New York, Syracuse, Binghamton, New Brunswick, NJ, Philadelphia and Northern New Jersey and PNR and associates described CLEC facilities in GTE territories in Los Angeles, Dallas, Tampa, Lexington, KY, Missouri and South Carolina.

[27] PNR & Associates report that there are 17 facilities-based CLECs in Los Angeles.

[28] For example, PNR reports that a majority of buildings with high concentrations of businesses are within 1,000 feet of CLEC facilities in Dallas, Tampa and Lexington, Kentucky. Further, our studies of the Phoenix and Seattle high capacity markets suggest that it is economic for CLECs to reach out for business 1,000 feet or more beyond their existing facilities.

[29] The UNE Fact Report goes on to observe that these shares compare favorably with the 5 percent share competitors of AT&T had attained three and one-half years after the *Execunet* decision. Moreover, market shares based on the number of lines tend to understate CLEC inroads, because the competitors tend to serve lines that generate above-average revenues.

37. These facts support the conclusion that in metropolitan areas, unbundled ILEC subscriber loops are not necessary inputs for CLECs and should therefore not be subject to mandatory unbundling.

38. While I cannot conclude at this time that subscriber loops are similarly not essential in producing local exchange service in other markets, facilities-based competition is progressing there as well. For example, the UNE Fact Report shows that a growing number of cable television companies have begun to upgrade their networks to offer telephone service (as part of a package with video, voice, and high-speed Internet access) and residential customers are now receiving telephone service from them. The most dramatic of these developments has of course been AT&T's investment of over $90 billion to acquire the largest and fourth largest cable television companies, TCI and MediaOne, accompanied by AT&T's announcement of its intention to serve residential customers by completely bypassing ILEC facilities.

> AT&T is on its way to bypassing the local telephone loop and reaching customers directly over cable-television lines thanks to our merger agreement with TCI and our joint venture with Time-Warner. These agreements will eventually give us access to more than 40% of all American homes.[30]

To be sure, the promise or statement of intention is not the same thing as fulfilled reality; on the other hand, the $90 billion is very real indeed.

39. Other technologies for providing facilities-based subscriber access to residential customers are emerging as well. For example, as the UNE Fact Report describes, AT&T, among the leading providers of PCS service, is now marketing its wireless service as a complete substitute for first and second wire phone lines.

40. I do not suggest these developments demonstrate that loops should be deemed non-essential for the competitive provision of local exchange service to residential customers at this time. What they do demonstrate is that even for residential markets, ILEC subscriber loops may well *prove* to be non-essential. In the event that Mr. Armstrong's bold expectations, which appear to have been endorsed by the market performance of AT&T stock, materialize, that will indeed be the case; and at that point, those ILEC facilities should no longer be subject to mandatory unbundling.

E. Directory Assistance and Operator Services

41. There are a number of companies that currently provide directory assistance and other operator services to major wireline and wireless telecommunications companies.[31] Indeed, in some cases, I understand, ILEC affiliates are themselves already purchasing these services from suppliers other than the ILEC itself.

42. For example, Volt reports that its Excell service provides directory and operator services to established and emerging network providers, including three of the six largest long distance companies.[32] InfoNXX provides operator and directory services to, among others, the seven million wireless customers of Bell Atlantic, U S West, and AirTouch.[33] Similarly, Metro

[30] C. Michael Armstrong, *Local Phone Companies Rip Off Consumers*, WALL ST. J., Mar. 1, 1999, at A22 (editorial by AT&T chairman).

[31] The NECI Report lists 10 providers of directory assistance and operators services and provides detailed descriptions on their offerings. The UNE Fact Report provides an independent (and overlapping) list that includes ten CLEC and five third-party providers. It also lists several Internet Web sites that provide directory services.

[32] *Making Excellence in Directory Assistance a Custom*, at http://www.volt.com, released August 12, 1996, obtained August 1, 1997.

[33] *National Alliance Jointly Purchases Specialized Directory Assistance Services from InfoNXX*, at http://ba.com, released June 25, 1996, obtained August 4, 1997.

One Telecommunications offers directory and operator services to a variety of providers, including local, long distance, wireless, and competitive access providers.[34] Finally, Teltrust provides directory and operator services to Cox Communications.[35]

F. Network Unbundling for Advanced Services[36]

43. In par. 35, the FCC sought comment on whether network elements that provide advanced services should be subject to mandatory unbundling.

44. I have already propounded the proposition that mandatory sharing of essential facilities should as a general rule be limited to situations in which the monopoly enjoyed by the ILEC is essentially a carryover from its past as a franchised utility company. When, in contrast, the facilities or inputs in question are new and are expected to be provided, not under a system of cost-plus rate base/rate of return regulation, but at the risk of investors, the potential losses in dynamic efficiency in deploying new technologies and bringing new services to the market will typically outweigh any benefits in cost savings from mandatory sharing.[37] There would be close to unanimous agreement among economists with the principle that the most creative form of competition, and the one most productive of benefits to consumers, is the

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[34] Metro One web page, www.metro1.com, obtained August 4, 1997.

[35] *Teltrust to Provide Telecommunications Services to Cox Communications*, at http://www.teleservices.com, released July 9, 1997, obtained April 7, 1998.

[36] The following several paragraphs are adapted from Kahn, Tardiff and Dennis Weisman, *The Telecommunications Act at Three Years: An Economic Evaluation of Its Implementation by the Federal Communications Commission*, INFORMATION ECONOMICS AND POLICY 1999, forthcoming.

[37] There have been serious estimates that the present asymmetrical restrictions on the incentives of RBOCs to offer new services have cost society billions of dollars annually in lost consumer benefits. See, for example, J.A. Hausman and T.J. Tardiff, *Benefits and Costs of Vertical Integration of Basic and Enhanced Telecommunications Services*, prepared for filing with the Federal Communications Commission, *Computer III Further Remand Proceedings*, CC Docket No. 95-20, on behalf of Bell Atlantic, Bell South, NYNEX, Pacific Bell, Southwestern Bell, and U S West, April 6, 1995.

process of innovation, the risk-taking investment in the new technologies—new methods of producing preexisting goods and services and the offering of new goods and services, thitherto unavailable.

45. As the renowned economist, Joseph A. Schumpeter, pointed out a half century ago, the "perennial gale of creative destruction" that lies at the heart of the capitalist economic process consists, at its essence, in a continuous process of creation and competitive erosion of monopoly, in which (as our patent laws likewise recognize) the prospect of exclusive enjoyment of the full fruits of successful innovation constitutes the essential incentive for innovators and imitators alike. Transient market dominance is an essential part of that dynamic process, which it is the purpose of the Act to release from regulatory constraints.

46. The more innovative the investments contemplated, the greater the uncertainties, both technological and commercial, the greater the risks, the more important is the prospect of the investor's exclusive enjoyment of the fruits of the ventures that turn out successfully. This proposition and the way in which the FCC's sharing rules conflict with it are most incisively spelled out by Justice Breyer, in the concurring portion of his separate opinion:

> [A] sharing requirement may diminish the original owner's incentive to keep up or to improve the property by depriving the owner of the fruits of the value-creating investment, research, or labor....Nor can one guarantee that firms will undertake the investment necessary to produce complex technological innovations, knowing that any competitive advantage deriving from those innovations will be dissipated by the sharing requirement.....Increased sharing by itself does not automatically mean increased competition. It is in the unshared, not in the shared, portions of the enterprise that meaningful competition would likely emerge. Rules that force firms to share every resource

> or element of a business would create, not competition, but pervasive regulation, for the regulators, not the marketplace, would set the relevant terms.[38]

47. Such is the case with high speed transmission services, which allow for rapid transmittal of data and high speed connections to the Internet.

48. So far as the obligation to share future facilities, created as a result of large and risky investments, are concerned, the issues were poignantly posed by the plans of AT&T, to which I have already alluded, for a multi-billion dollar upgrading of the cable of TCI, which it has just acquired, in order to provide local, Internet and advanced video services; by the mounting pressures on the FCC by competitors and public agencies to condition its approval of the merger on AT&T's giving competitors access to those facilities—presumably at FCC-determined rates—and by the equally costly and risky plans of the incumbent telephone companies to compete in these same markets by providing digitalization of subscriber access lines. AT&T strenuously resisted the proposals to impose such a condition upon it[39] and the FCC rejected them, presumably in the belief they would be incompatible with Schumpeterian competition and with Congress's deregulation of the cable companies in recognition of the need for encouraging their costly investment in upgrading their telecommunications capabilities. AT&T's economic experts have articulated the dangers of improper regulation of advanced services:

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[38] *AT&T Corp. v. Iowa Utilities Board*, 119 S. Ct. 721, 752 (1999) (Breyer, J. concurring in relevant part). See also, Robert W. Crandall, *The Telecom Act's Phone-y Deregulation* WALL ST. J., Jan. 27, 1999. ("Why should these firms invest in new, often risky technology for delivering advanced, high-speed services if they are to be required to offer any such new facilities to their rivals at cost"—moreover, "not the Company's actual cost," but "at prices that reflect *most efficient* technology?")

[39] *See* Bryan Gruley, *Must AT&T Give Internet Rivals Access To TCI's Network?* WALL ST. J., Jan. 15, 1999, at A1.

> It would be against the public interest to subject the parties' last mile broadband data transport facilities to any form of regulation at this time....There are many competitors, including the ILECs, that are actively developing broadband transport services...The xDSL services that are currently being deployed by the incumbent LECs alone constitute a significant and attractive commercial alternative to the internet cable services that TCI and others offer...The] demand to unbundle broadband transport will engender intrusive regulation of an emerging new service that requires massive entrepreneurial investments and whose marketplace success is far from assured...Forced unbundling with its attendant regulatory uncertainty would likely slow down the investment in the development of broadband last mile investment. Investing under the shadow of uncertain regulatory rules in an innovative service exacerbates the already substantial risks associated with that investment.[40]

49. By a parity of reasoning, the ILECs argue persuasively for a similar freedom from the obligation to share—and particularly at prices reflecting the FCC's most-efficient firm standard—and for rejecting also the FCC's proffered condition of giving them that freedom if only they will offer the service through fully-separated subsidiaries—which would force them to sacrifice presumably substantial economies of scale or scope.

50. Consider the anomaly of expecting the incumbent local telephone companies to incur these huge costs in competition with giants such as AT&T/TCI. Should their new services lose that competition, they would have to absorb those costs: none of them could be recovered in the FCC-dictated charges for their network elements, because an ideally-efficient firm never fails! Should the new service succeed, the incumbent provider would be required to make it available to would-be entrants on a wholesale basis at prices based on the efficient-firm cost standard, giving them a free ride on its development and marketing efforts. Who would

[40] Declaration of Professors Janusz A. Ordover and Robert W. Willig, attached to AT&T's and TCI's Joint Reply to Comments and Joint Opposition to petitions to Deny or to Impose Conditions, *In the Matter of Joint Application of AT&T Corp. and Tele-Communications, Inc. for Transfer of Control to AT&T of Licenses and Authorizations Held by TCI and its Affiliates or Subsidiaries*, CS Docket No. 98-178, November 13, 1998. Ordover and Willig make no effort to reconcile their compelling argument here that government restrictions can stifle innovation incentives with their previous advocacy of TELRIC pricing for access to ILEC networks.

undertake costly and risky innovations in the face of such a prospect of grossly asymmetrical treatment of successes and failures?[41]

51. Not only economic theory, but market developments support the proposition that regulatory intervention is unnecessary and counterproductive for advanced telecommunications services. The UNE Fact Report surveys the development of competition for advanced broadband services—a story which has also been widely covered in the business and trade press.[42] The facts of the matter are:

- There are several technologies other than the ILEC networks for bringing advanced services to customers. These include (1) cable television networks, e.g., cable modems, (2) wireless broadband services, (3) satellite, and (4) electric utility facilities
- The ILEC's xDSL technology lags behind cable modems in bringing high speed access to residential consumers and is expected to remain behind, as indicated in Table 1.

[41] It is not only in their effect on the *incentives* of the ILECs to undertake costly and risky investment in modernizing their networks that the FCC's sharing and network element pricing are likely to prove so harmful. They could also severely impair the *ability* of the incumbents to finance such ventures, by sharply reducing their internal cash flow: retained earnings are frequently the preferable means of financing such large-scale investment projects. *See* Kenneth A. Froot, David S. Scharfstein and Jeremy C. Stein, *A Framework for Risk Management*, HARVARD BUSINESS REVIEW, November-December, 1994, pp. 91-102. Steven Fazzari, R. Glenn Hubbard and Bruce Petersen report that retained earnings constitute more than 70 percent of the source of funds for corporate investment (p. 147, Table 1) and that on average firms reduce their capital expenditures by more than 36 cents for each $1 reduction in cash flow (p. 167, Table 4). (*Financing Constraints and Corporate Investment*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, No. 1, 1988, pp. 141-195.)

[42] For example, the front page of the April 28, 1999 *New York Times* describes high speed services for residential customers, pointing out that cable modems have a head start over the DSL services provided over ILEC networks.

- The ILECs are not even ahead with respect to broadband services using xDSL technology. According to the UNE Fact Report, CLECs such as Covad have been faster to market than they.

In these circumstances, the imposition of unique handicaps on the ILECs would, quite simply, be anticompetitive.

Table 1: Alternative Residential Broadband Forecasts.

A. Source: Forrester

	1998		2002	
	Volume (million)	Share	Volume (million)	Share
Cable Modems	0.7	97%	13.6	86%
XDSL	0.025	3%	2.2	14%
Total	0.725	100%	15.8	100%

B. Source: IDC

	1998		2002	
	Volume (million)	Share	Volume (million)	Share
Cable Modems	0.63	97%	8.15	66%
XDSL	0.021	3%	4.23	34%
Total	0.651	100%	12.38	100%

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 24, 1999.

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Professor Kahn is the Robert Julius Thorne Professor of Political Economy, Emeritus, at Cornell University and a Special Consultant to NERA.

He has been Chairman of the New York Public Service Commission; Chairman of the Civil Aeronautics Board; and Advisor to the President (Carter) on Inflation and Chairman of the Council on Wage and Price Stability.

Professor Kahn received his Bachelor's (summa cum laude) and Master's degrees from New York University and a Doctorate in Economics from Yale University. Following service in the Army, he served as Chairman of the Department of Economics at Ripon College, Wisconsin. He moved to the Department of Economics at Cornell University, where he remained until he took leave to assume the Chairmanship of the New York Public Service Commission. During his tenure at Cornell, Professor Kahn served as Chairman of the Department of Economics, member of the Board of Trustees of the University and Dean of the College of Arts and Sciences.

Throughout his career, Professor Kahn has served on a variety of public and private boards and commissions including: the Attorney General's National Committee to Study the Antitrust Laws; the senior staff of the President's Council of Economic Advisors; the Economic Advisory Council of American Telephone & Telegraph Company; the National Academy of Sciences Advisory Review Committee on Sulfur Dioxide Emissions; the Environmental Advisory Committee of the Federal Energy Administration; the Public Advisory Board of the Electric Power Research Institute; the Board of Directors of the New York State Energy Research and Development Authority; the Executive Committee of the National Association of Regulatory Utility Commissioners; the National Commission for Review of Antitrust Laws and Procedures; the New York State Council on Fiscal and Economic Priorities; the Governor of New York's Fact-Finding Panel on Long Island Lighting Company's Nuclear Power Plant at Shoreham, L.I.; the Governor of New York's Advisory Committee on Public Power for Long Island; the National Governing Board of Common Cause; and, in 1990, as Chairman of the International Institute for Applied Systems Analysis Advisory Committee on Price Reform and Competition in the USSR.

He has also served as a court-appointed expert in State of New York v. Kraft General Foods, Inc., et al., U.S. District Court, S.D.N.Y.; Advisor to New York Governor Carey on Telecommunications Policy; and as a consultant to the Attorneys General of New York, Pennsylvania and Illinois, the Ford Foundation, the National Commission on Food Marketing, Federal Trade Commission, Antitrust Division of the Department of Justice, the U.S. Department of Agriculture and the City of Denver on charging and financing of Stapleton Airport.

He has received L.L.D. honorary degrees from Colby College, Ripon College, Northwestern University, the University of Massachusetts and Colgate University, and an honorary D.H.L. from the State University of New York, Albany; he also received the Distinguished Transportation Research Award of the Transportation Board Forum, The Alumni Achievement Award of New York University, the award of the American Economic Association's Transportation and Public Utilities Group for Outstanding Contributions to Scholarship, The Henry Edward Salzberg Honorary Award from Syracuse University for Outstanding Achievement in the Field of Transportation, and the Burton Gordon Feldman Award for Distinguished Public Service from Brandeis University; and was elected to membership in the American Academy of Arts and Sciences and Vice President of the American Economic Association. He was for 15 years a regular commentator on PBS's "The Nightly Business Report."

He has testified before many U.S. Senate and House Committees, the Federal Power Commission, the Federal Energy Regulatory Commission and numerous state regulatory bodies.

Professor Kahn's publications include *Letting Go: Deregulating the Process of Deregulation; Great Britain in the World Economy; Fair Competition: The Law and Economics of Antitrust Policy* (co-authored); *Integration and Competition in the Petroleum Industry* (co-authored); and *The Economics of Regulation.* He has written numerous articles which have appeared in *The American Economic Review, The Quarterly Journal of Economics, The Journal of Political Economy, Harvard Law Review, Yale Journal on Regulation, Yale Law Journal, Fortune, The Antitrust Bulletin* and *The Economist,* among others.

EDUCATION:

YALE UNIVERSITY
Ph.D., Economics, 1942

UNIVERSITY OF MISSOURI
Graduate Study, 1937-1938

NEW YORK UNIVERSITY
M.A., Economics, 1937
A.B. (summa cum laude), Economics, 1936

EMPLOYMENT:

1961-1974	NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC.
1980-	Special Consultant
	CORNELL UNIVERSITY
1947-1989	Assistant Professor; Associate Professor; Robert Julius Thorne Professor of Economics; Robert Julius Thorne Professor of Political Economy, Emeritus, 1989-; Chairman, Department of Economics; Dean, College of Arts and Sciences; on leave 1974-80.
	NEW YORK UNIVERSITY SCHOOL OF LAW
Spring 1989	Visiting Meyer Professor of Law
	UNITED STATES GOVERNMENT
1978-1980	Advisor on Inflation to President Carter
1978-1980	Chairman, Council on Wage and Price Stability
1977-1978	Chairman, Civil Aeronautics Board
1955-1957	Senior Staff, Council of Economic Advisors to the President
1943	U.S. Army, Private
1943	War Production Board
1942	Associate Economist, International Economics Unit, Bureau of Foreign and Domestic Commerce, Department of Commerce
1941-1942	Associate Economist, Antitrust Division, U.S. Department of Justice
	NEW YORK STATE PUBLIC SERVICE COMMISSION
1974-1977	Chairman
	BROOKINGS INSTITUTION
1940, 1950-1951	Staff Economist
	RIPON COLLEGE
1945-1947	Assistant Professor, Chairman, Department of Economics
	TWENTIETH CENTURY FUND
1944-1945	Research Economist

	COMMISSION ON PALESTINE SURVEYS
1943-1944	Economist
	UNIVERSITY OF MISSOURI
1937-1938	Teaching Assistant

CONSULTANCIES AND PROFESSIONAL ACTIVITIES:

1994-1995	Antitrust Division, U.S. Department of Justice, on the application of Ameritech for waivers of the interexchange restrictions in the AT&T Modified Final Judgment
1994	American Airlines on code-sharing
1993-1994	Court-appointed expert in State of New York v. Kraft General Foods, Inc., et al., U.S. District Court, S.D.N.Y.
1992	New Zealand Telecom on the progress of competition in New Zealand telecommunications
1992	Rochester Telephone Company on corporate restructuring and deregulation
1992	Russian Government on economic reform
1991	British Mercury on terms of competition with British Telecom
1989	City of Denver on charging and financing of Stapleton Airport
1988-1990	Attorneys General, New York and Pennsylvania, on airline mergers
1985	Attorney General, State of Illinois, on Illinois Bell rates
1981-1984	City of Long Beach, California, the Coca-Cola Company and American Airlines on antitrust litigation
1981-1997	Economic commentary, Nightly Business Report (PBS)
1980-1982	Advisor to Governor Carey on Telecommunications Policy
1968	Ford Foundation
1966	National Commission on Food Marketing
1965,1974	Federal Trade Commission
1963-1964	Antitrust Division, Department of Justice
1960-1961	U.S. Department of Agriculture
1957-1961	Boni Watkins, Jason & Co.

See also the list of testimony below.

MEMBERSHIPS:

1998-	Member, Committee for a Study of Competition in the U.S. Airline Industry, Transportation Research Board, National Research Council
1992-1994	Member, New York State Telecommunications Exchange
1992-1993	Member, Ohio Blue Ribbon Panel on Telecommunications Regulation
1991-	Board of Editors, *Review of Industrial Organization*
1990-1992	Chairman, International Institute for Applied Systems Analysis Advisory Committee on Price Reform and Competition in the USSR
1986	Governor Cuomo's Advisory Panel on public power for Long Island

1983-1989	Governor Cuomo's Fact-finding Panel on Long Island Lighting Company's Nuclear Power Plant at Shoreham, L.I.
1983-1990	New York State Council on Fiscal and Economic Priorities
1982-	*The American Heritage Dictionary* Usage Panel
1982-1985	Governing Board, Common Cause
1980-1986	Director, New York Airlines
1978-1979	National Commission for the Review of Antitrust Laws and Procedures
1975-1977	Project Committee, Electric Utility Rate Design Study, Electric Power Research Institute
1974-1975	National Academy of Science Review Commission on Sulfur Oxide Emissions
1974-1977	Public Advisory Board, Electric Power Research Institute
1974-1977	Environmental Advisory Committee, Federal Energy Administration
1974-1977	Executive Committee, National Association of Regulatory Utility Commissioners, and Chairman, Committee on Electric Energy
1968-1974	Economic Advisory Board, American Telephone & Telegraph Corporation
1965-1967	Economic Advisory Committee, U.S. Chamber of Commerce
1967-1969	Chairman, Tompkins County Economic Opportunity Corporation
1964-1969	Board of Trustees, Cornell University
1961-1964	Board of Editors, *American Economic Review*
1953-1955	Attorney General's National Committee to Study the Antitrust Laws

HONORS AND AWARDS:

Apr 1999	J. Rhoads Foster Award for achievements in economic regulation
Jan 1998	Recipient of the 1997 Sovereign Fund Award "Honoring Vision, Commitment and Achievement in the Pursuit of Individual Freedom"
Dec 1997	The 1997 L. Welch Pogue Award For Lifetime Contributions to Aviation
May 1995	Wilbur Cross Medal for outstanding achievement, Yale University
Mar 1989	Burton Gordon Feldman Award for Distinguished Public Service, Gordon Public Policy Center, Brandeis University
Feb 1989	Distinguished Service Award, Public Utility Research Center, University of Florida
Nov 1988	International Film and TV Festival of New York, Bronze Medal presented to The Nightly Business Report/WPBT2 for Editorial/Opinion Series written by Alfred E. Kahn
Apr 1986	Harry E. Salzberg 1986 Honorary Medallion for outstanding achievement in the field of transportation
Oct 1984	Distinguished Transportation Research Award of the Transportation Research Forum
1981-1982	Vice President, American Economic Association
1978	Richard T. Ely lecturer, American Economic Association, 1978
1978	Rejection Scroll, International Association of Professional Bureaucrats
May 1985	State University of New York (Albany), DHL (Hon.)
May 1983	Colgate University, LL.D. (Hon.)
June 1982	Northwestern University, LL.D. (Hon.)
May 1980	Ripon College, LL.D. (Hon.)
May 1979	University of Massachusetts, LL.D. (Hon.)

May 1978	Colby College, LL.D. (Hon.)
1977-	Fellow of the American Academy of Arts and Sciences
1976	Distinguished Alumni Award, New York University
1976	American Economic Association, Section on Public Utilities and Transportation, citation for distinguished contributions
1954-1955	Fulbright Fellowship, Italy
1935-	Phi Beta Kappa
1939-1940	Yale-Brookings Fellow

BOOKS:

Letting Go: Deregulating the Process of Deregulation, Michigan State University Institute of Public Utilities, July 1998.

The Economics of Regulation, 2 volumes, John Wiley, 1970 and 1971. Reprinted by The MIT Press, 1988, with a new "Introduction: A Postscript, Seventeen Years After," pp. xv-xxxvii.

Integration and Competition in the Petroleum Industry, (with Melvin G. DeChazeau), Petroleum Monograph Series, Volume 3 (Yale University Press, 1959). Reprinted in 1971.

Fair Competition: The Law and Economics of Antitrust Policy (with Joel B. Dirlam) (Cornell University Press, 1954). Reprinted by Greenwood Press, 1970.

Great Britain in the World Economy (Columbia University Press, 1946). Reprinted in 1968.

MAJOR ARTICLES:

"The Telecommunications Act At Three Years: An Economic Evaluation of Its Implementation by The Federal Communications Commission," with Timothy J. Tardiff and Dennis L. Weisman, forthcoming, *Information Economics and Policy*.

"Bribing Customers to Leave and Calling it 'Competition,'" *The Electricity Journal*, May 1999, pp. 88-90.

"Comments on Exclusionary Airline Pricing," *Journal of Air Transport Management*, Volume 5, Issue 1, January 1999, pp. 1-12.

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"The Challenge for Federal and State Regulators: Transition from Regulation to Efficient Competition in Electric Power," with William J. Baumol and Paul L. Joskow, Edison Electric Institute, December 9, 1994.

"Competition in the Electric Industry Is Inevitable and Desirable," *The Electric Industry in Transition*, Public Utility Reports, Inc. and New York State Energy Research and Development Authority, December 1994, Chapter 3, pp. 21-31.

"Can Regulation and Competition Coexist? Solutions to the Stranded Cost Problem and Other Conundra," *The Electricity Journal*, Volume 7, Number 8, October 1994, pp. 23-35.

"The Pricing of Inputs Sold to Competitors: A Comment," in *Yale Journal on Regulation*, Vol. 11, No. 1, Winter 1994, pp. 225-240.

"Airline Deregulation," in *The Fortune Encyclopedia of Economics*, David R. Henderson, Ph.D., ed., New York: Warner Books, 1993, pp. 379-384.

"Change, Challenge and Competition The Report of the National Commission to Ensure a Strong Competitive Airline Industry, August 1993," *Regulation*, No. 3, 1993.

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