CURRICULUM VITAE

KENNETH S. FLAMM

CURRENT POSITION

Professor and Dean Rusk Chair, University of Texas at Austin.

Fields of specialization: economic analysis of innovation in high technology industries; science and technology policy; international economics; technology modeling; applied econometrics; the computer, semiconductor, and internet industries; defense economics.

CURRENT RESEARCH

Determinants of innovation in semiconductors, computers, and telecommunications; economics of Internet use and deployment; the economic analysis of R&D, technology, and technology policy.

PREVIOUS POSITIONS

1995 to 1998, Senior Fellow, The Brookings Institution

1994 to 1995, Special Assistant to the Deputy Secretary of Defense (Dual Use Technology Policy) and Principal Deputy Assistant Secretary of Defense (Economic Security)

1993 to 1994, Acting Assistant Secretary of Defense (Economic Security), Principal Deputy Assistant Secretary of Defense and Special Assistant to the Under Secretary (Dual Use Technology Policy and International Programs)

1990 to 1998, Adjunct Professor, Department of Economics, The George Washington University.

1987 to 1993, Senior Fellow, The Brookings Institution.

1979 to 1987, Research Associate, The Brookings Institution.

1984 to 1989, Professorial Lecturer, Department of Economics, The George Washington University.

1979 to 1985, Assistant Professor, Department of Economics, University of Massachusetts, Amherst.

1979, Instructor of Economics, Clark University.

1978, Teaching Assistant, microeconomics, M.I.T.

1978, Economic Advisor, Directorate of Income Policy, Ministry of Finance and Public Credit, Mexico.

1977-78, Associate Professor, Department of Economics, Instituto Tecnologico Autonomo de Mexico.

1976, Teaching Assistant, econometrics, M.I.T.

1975-76, Research Assistant, World Oil Model, Energy Laboratory, M.I.T.

EDUCATION

Ph.D., Economics Massachusetts Institute of Technology, 1979
A.B. (Honors), Economics, Stanford University, 1973

HONORS and AWARDS

Danforth Graduate Fellowship (selected 1973)
Phi Beta Kappa (elected Junior year, 1972)
National Merit Scholar (selected 1969).
Myers Prize for Best Honors Thesis in Economics, Stanford University, (1973)
U.S. Department of Defense, Distinguished Public Service Medal, (awarded by Secretary of Defense, 1995)

MEMBERSHIPS

Senior Research Fellow, IC^2 Institute, The University of Texas at Austin.

Board on Science, Technology, and Economic Policy, National Research Council

Chair, Committee on Intangible Assets: Measuring and Enhancing Their Contribution to Corporate Value and Economic Growth, National Research Council

Vice Chair, Committee on Comparative Innovation Policy: Best Practice in National Technology Programs, National Research Council

Committee on the Rationale and Goals of the U.S. Civil Space Program, National Research Council

Committee on the Future of Supercomputing, National Academy of Sciences, Computer Science and Technology Board

Committee on Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Program, National Academy of Sciences.

Steering Group on Measuring and Sustaining the New Economy, National Research Council

Chair, NATO Science Committee Panel for Science and Technology Policy and Organization.

Economics of Innovation and New Technology, Editorial Board.

Federal Networking Council Advisory Committee.

National Research Council Steering Group on Government-Industry Partnerships.

National Research Council Steering Group on Measuring and Sustaining the New Economy.

Roundtable on the Geo Economics of Military Preparedness, Council on Foreign Relations.

Study Group on Consolidation, Downsizing, and Conversion in the U.S. Military Industrial Base, Council on Foreign Relations.

Study Group on American Commercial Diplomacy in Asia, Council on Foreign Relations.

Study Group on Defense Industry Globalization, Conversion, and the Arms Trade, Council on Foreign Relations.

Study Group on Consolidation, Downsizing, and Conversion in the U.S. Military Industrial Base, Council on Foreign Relations.

Advisory Committee, Center for Innovation Policy Research, Budapest, Hungary.

Defense Science Board Task Force on International Arms Cooperation.

Defense Science Board 1995 Summer Study.

Advisory Panel on Information Technology and Research, Advisory Panel on Multinational Firms and the U.S. Technology Base, Office of Technology Assessment, U.S. Congress.

Panel on the Federal Role in the Commercialization of Technology, National Research Council.

Expert Advisory Panel, National Science Board Committee on Industrial Support for R&D.

National Science Foundation Advisory Committee on Data and Policy Analysis.

Expert Working Party on High Performance Computers and Communications, Organization for Economic Cooperation and Development.

Co-chair, Task Force on the Federal Role in Commercialization of New Technology; Member, Trade and Investment Advisory Committee, Council on Competitiveness.

Referee:
Quarterly Journal of Economics, Journal of Industrial Economics; Rand Journal of Economics; Review of Economics and Statistics, International Economic Journal; Research Policy; Journal of Development Economics; Journal of International Economics; Science; Growth and Change; International Organization; World Development, Telecommunications Policy, Structural Change and Economic Dynamics.

Consultant (Public Sector):
National Academy of Science; World Bank, Development Research, Industry Departments; U.S. Congress, Office of Technology Assessment; Latin American Economic System; Organization for Economic Cooperation and Development; U.S. Agency for International Development; U.S. Department of Justice; U.S. Department of Defense; Mexico, Ministry of Finance; International Growth Centre; Australia, Department of Communications.

Testimony before U.S. Congress, including Joint Economic Committee; Senate Governmental Affairs Committee; House Committee on Space, Science and Technology; House Subcommittee on Telecommunications; House Armed Services Committee; House Appropriations Committee; U.S. International Trade Commission; U.S. Department of Commerce; Federal Accounting Standards Advisory Board; Superior Court, San Francisco, California; Federal Courts: Eastern District of Pennsylvania, Western District of Texas, Eastern District of Texas, Northern District of California.

PERSONAL DATA
Born: Rio de Janeiro, Brazil
Citizenship: United States

Complete fluency in Spanish; reading knowledge of French, Italian, Portuguese; elementary Japanese.

GRANTS AS PRINCIPAL, CO-PRINCIPAL INVESTIGATOR, LAST 12 YEARS

Texas Connects Coalition & Technology for All, "Digital Inclusion," 2012-2013

National Science Foundation, "Modeling Pharmaceutical Innovation Pipelines," 2010-2012

National Science Foundation, "Modeling Innovation Chains Using Case-Based Econometrics: Nano-electronics and Biotechnology Applications," 2008-2012

Congressional Research Service, Library of Congress, "Winning the Globalization Game: How Countries Compete in the 21st Century," 2007-2008

"Semiconductor Industry Economics," Kauffman Foundation, 2006-2008.

Congressional Research Service, Library of Congress, "Changing Modes of Defense Procurement: Implications for Pricing and Innovation in the US Defense Industry," 2005-2006.

National Science Foundation, "Internet Use in the Americas," 2004-2006.

Ford Foundation, Hewlett Foundation, "An Experiment in Cooperative Policy Research: Normalizing Inter-American Relations with Cuba," 2003-2006.

Congressional Research Service, Library of Congress, "Broadband Policy in Comparative International Perspective," 2004-2005.

Rockefeller Foundation, "Researching the Economic Implications of Fair Use," 2002-2004.

Congressional Research Service, Library of Congress, "Exploring the Digital Divide: Regional Differences in Patterns of Internet Use in the United States," 2003-2004.

SEMATECH International, "Improving Semiconductor Industry Models," 2002-2003.

Congressional Research Services, Library of Congress, "Internet Use in Developing and Industrializing Countries," 2002-2003.

Pew Internet and American Life Project, "Determinants of Internet Use by US Households," 2002-2003.

PUBLICATIONS

Books:

(with S. Nagaoka, M. Kondo, and C. Wessner, Ed)., 21st Century Innovation Systems for Japan and the United States: Lessons from a Decade of Change, (Washington: National Academies Press), 2009.

(with others), Committee on the Rationale and Goals of the U.S. Civil Space Program), America's Future in Space: Aligning the Civil Space Program with National Needs, (Washington: National Academies Press), 2009.

(with others), Committee on the National Defense Stockpile, National Research Council, Managing Materials for a 21st Century Military, (Washington: National Academies Press), 2007.

(with others), Committee on the Future of Supercomputing, National Research Council, Getting Up to Speed: The Future of Supercomputing, (Washington: National Academies Press), 2004.

Mismanaged Trade? Strategic Policy and the Semiconductor Industry, (Washington: Brookings Institution), 1996.

Changing the Rules: Technological Change, International Competition and Regulation in Communications, (with Robert Crandall, ed.), (Washington: Brookings Institution), 1989.

Creating the Computer: Government, Industry, and High Technology, (Washington: Brookings Institution), 1988.

Targeting the Computer: Government Support and International Competition, (Washington: Brookings Institution), 1987.

(with J. Grunwald), The Global Factory: Foreign Assembly in International Trade, (Washington: Brookings Institution), 1985.

(with M. Bishop and R. Davenport), A Definitional Study of the Private Sector in Guyana, (Georgetown, Guyana: USAID), 1982.

Articles:

(with P. Mudliar and S. Strover), "Outside Looking In: Shaping Access and Use of PCCs," in G. Marsden and J. May, Ed., Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes - Volume 2, (New York: Association for Computing Machinery), 2014.

"Measuring Disconnectedness: Understanding US. Broadband Unavailability," in R. Taylor and A. Schejter, Ed., Beyond Broadband Access, (New York: Fordham University Press), 2013.

"Economic Impacts of International R&D Coordination: SEMATECH and the International Technology Roadmap," in Nagaoka, et. al., 21st Century Innovation Systems for Japan and the United States, (Washington: National Academies Press), 2009.

(with S. Nagaoka), "The Chrysanthemum Meets the Eagle—The Coevolution of Innovation Policies in Japan and the United States," in Nagaoka, et. al., 21st Century Innovation Systems for Japan and the United States, (Washington: National Academies Press), 2009.

(with A. Aizcorbe and A. Kurshid), "The Role of Semiconductor Inputs in IT Hardware Price Declines," in E. Berndt, Ed., Hard to Measure Goods and Services—Essays in Honor of Zvi Griliches, (Chicago and National Bureau of Economic Research), 2008.

(with A. Chaudhuri), "An analysis of the determinants of broadband access" Telecommunications Policy, Volume 31, Issues 6-7, July-August 2007.

(with Q. Zhong and A. Chaudhuri), "Issues in Internet Governance," in S. Park, Ed., Strategies and Policies in Digital Convergence, (Harrisburg, PA: Idea Group), 2007.

(with A. Chaudhuri and Associates) "The Internet, the Government, and E-Governance," in P. Hernon, Ed., Comparative Perspectives on E-Government: Serving Today and Building for Tomorrow, (Boston: Scarecrow Press), 2006.

(with A. Chaudhuri) "Is A Computer Worth a Thousand Books? Internet Access and the Changing Role of Public Libraries," Review of Policy Research, vol. 23, no. 1, 2006.

(with A. Chaudhuri and J. Horrigan) "An Analysis of the Determinants of Internet Demand," Telecommunications Policy, vol. 29, nos. 9-10, 2005.

"Post-Cold War Policy and the U.S. Defense Industrial Base," in The Bridge (National Academy of Engineering), vol. 35, no. 1, 2005.

"Moore's Law and the Economics of Semiconductor Price Trends," in D.W. Jorgenson and C.W. Wessner, Ed., Productivity and Cyclicality in Semiconductors: Trends, Implications, and Questions," (Washington: National Research Council), 2004.

"The New Economy in Historical Perspective: Evolution of Digital Technology," in New Economy Handbook, (Academic Press), 2003.

"SEMATECH Evolving: A New Model for Global Industrial R&D Coordination," IEEE Design and Test of Computers, November-December 2003 (invited submission).

"Microelectronics Innovation: Understanding Moore's Law and Semiconductor Price Trends," International Journal of Technology, Policy, and Management, vol. 3, no. 2, 2003.

(with Qifei Wang), "The Impact of SEMATECH on U.S. Semiconductor Industry R&D," C. W. Wessner, Ed., Regional and National Programs to Support the Semiconductor Industry, (Washington: National Academy of Sciences), 2003.

"Microprocessors and Computers: The Phenomenon of Price Decline," in D.W. Jorgenson and C. W. Wessner, Ed., Measuring and Sustaining the New Economy, (Washington: National Academy of Sciences), 2002.

"The Federal Partnership with Industry in U.S. Computer Research: History and Recent Concerns," in C. W. Wessner, Ed., Capitalizing on New Needs and Opportunities: Government-Industry Partnerships in Biotechnology and Information Technologies, (Washington: National Academy of Sciences), 2001.

"From Endgame to N-Game: Competition vs. Economies of Scale in the Military Aircraft Industry," Chicago Policy Review, vol. 3, no. 1, 1999 (invited submission).

"Digital Convergence?" in Eisenach and Lenard, Ed., Competition, Innovation, and the Microsoft Monopoly: Antitrust in the Digital Marketplace, (Boston: Kluwer Academic Publishers), 1999.

The Policy Context for Military Aerospace Offsets," in C. Wessner Ed., Trends and Challenges in aerospace Offsets, (Washington: National Academy Press), 1999.

Redesigning the Defense Industrial Base," in A. Markusen and S. Costigan, Arming the Future: A Defense Industry for the 21st Century, (New York: Council on Foreign Relations), 1999.

"U.S. Defense Industry Consolidation in the 1990s," in Susman and O'Keefe,Ed**.,** The Defense Industry in the Post-Cold War Era, (Oxford, U.K.: Pergamon), 1998.

"Policy Issues in Aerospace Offsets," in Charles Wessner and Alan W. Wolff, Ed., Policy Issues in Aerospace Offsets, (Washington: National Academy Press), 1997.

"Technical Progress and Coinvention in Computing and in the Use of Computers: Comment," Brookings Papers on Economic Activity, Microeconomics 1996, (Washington: Brookings Institution), 1997.

(with J.E. Nolan, J.D. Steinbruner, S.E. Miller, D. Mussington, W.J. Perry, and A.B. Carter), "The Imperatives for Cooperation," in J.E. Nolan, Ed., Global Engagement, (Washington: Brookings Institution), 1994.

"Semiconductor Dependency and Strategic Trade Policy," Brookings Papers On Economic Activity, Microeconomics, 1993, no.1, (Washington: Brookings Institution), 1993.

"The Computer Industry in Advanced Industrial Economies," in B. Willenius, Ed., Electronics Industry Development, (Washington: The World Bank), 1993.

"Measurement of DRAM Prices: Technology and Market Structure," in M. Foss, M. Manser, and A. Young, Ed., Prices and Their Measurement, Proceedings of a Conference of the National Bureau of Economic Research and the Conference on Income and Wealth, (Chicago: University of Chicago Press and NBER, 1993).

"Forward Pricing vs. Fair Value: An Analytical Assessment of Dumping in DRAMs," in T. Ito and A. Krueger, Ed., Trade and Protectionism, (Chicago: University of Chicago Press and NBER, 1993).

"Coping With Strategic Competition in Semiconductors: The EC Model as an International Framework," in M. Humbert, Ed., The Impact of Globalisation on Europe's Firms and Industries, (London and New York: Pinter), 1993.

Strategic Arguments for Semiconductor Trade Policy, Review of Industrial Organization, vol. 7, 1992.

"Semiconductors," in Gary Hufbauer, Ed., Europe 1992: An American Perspective, (Brookings Institution, May 1990).

"Robotics Technology" in H. Soesastro and M. Pangistu, Eds., Technological Challenge in the Asian Pacific Economy, (Boston: Allen and Unwin, 1990).

"Industrial Research and Corporate Restructuring: An Overview of Some Issues," in National Academy of Science, Corporate Research and Development, (National Academy Press, 1990).

"Technological Advance and Costs: Computers Versus Communications," in Crandall and Flamm, Eds., Changing the Rules:Technological Change, International Competition, and Regulation in Communications, (Washington: Brookings Institution),1989.

"Rationalizing Technology Investment,"(with Thomas McNaugher), in John Steinbruner, Ed., Restructuring American Foreign Policy, (Washington: Brookings Institution, November 1988).

The Changing Pattern of Industrial Robot Use," in R. Cyert and D. Mowery,Eds., Studies in Technological Change, Employment and Policy, (Ballinger), 1988)

"The Transfer of Advanced Technology: Recent Trends and Implication for Mexico," Mexican Studies, vol. 2, no. 2, Summer 1986.

"Comments on Gil Diaz and Trebat," in P. Musgrave, Ed., Mexico and the United States: Studies in Economic Interaction, (Boulder: Westview Press, 1985).

"The Volatility of Offshore Investment," in Journal of Development Economics, vol. 16, 1984.

"Technology Policy in International Perspective," in Policies for Industrial Growth in a Competitive World, Joint Economic Committee, Sub-committee on Economic Goals an Intergovernmental Relations, U.S. Congress, April 1984.

In Progress:

(with S. Strover and Y. Sang), "Public Computing Centers: Beyond 'Public' and 'Computing'," presented at Telecommunications Policy Research Conference, September 2013, Arlington, VA, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2241173.

"Federal Subsidies and Broadband Competition," presented at TPRC 43, Arlington, VA, September 2015, available at

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2587353 ; previous versions presented at NBER Summer Institute 2013 Economics of IT and Digitization Workshop, Cambridge, MA, July 2013, available at http://conference.nber.org/confer/2013/SI2013/PRIT/Flamm.pdf; "Connectedness and Competition: Determinants of Service Provision in U.S. Broadband Markets," presented at Telecommunications Policy Research Conference, September 2011, Arlington, VA, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1985791.

"A Tale of Two Standards: Patent Pools and Innovation in the Optical Disk Drive Industry," **National Bureau of Economic Research Working Paper 18931**, March 2013, available at SSRN: http://ssrn.com/abstract=2245440, currently under revision.

"Correlates of Quality Improvement in U.S. Broadband Service," presented at TPRC 42, the 42nd Research Conference on Communication, Information, and Internet Policy, Arlington, VA, September 2014, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2418746 ; previous versions are "Dynamics of Change in Service Quality on US Broadband Networks: An Exploratory Study," presented at NBER Summer Institute Workshop on the Economics of IT and Digitization, July 2012; Telecommunications Policy Research Conference, September 2012, Arlington, VA, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2031220; currently under revision.

"Causes and Economic Consequences of Diminishing Rates of Technical Innovation in the Semiconductor and Computer Industries," presented at APPAM Fall Research Conference, Albuquerque, NM, November 6, 2014, https://appam.confex.com/appam/2014/webprogram/Paper9969.html; previous version was "The Microeconomics of Microprocessor Innovation," presented at NBER Summer Institute- Productivity Potpourri Workshop, July 2007, available at http://users.nber.org/~confer/2007/si2007/PRB/flamm.pdf ; currently under revision.

Other Publications and Reports:

(with M. Naaman) "Sub-Regressions In Antitrust Class Cert. Can Be Unreliable," Law360, December 17, 2014, available at http://www.law360.com/articles/604821/sub-regressions-in-antitrustclass-cert-can-be-unreliable .

"Coping with Globalization in Semiconductors," World Politics Review, June 15, 2010, available at http://www.worldpoliticsreview.com/articles/5795/coping-with-globalization-in-semiconductors .

(with S. Nagaoka), "The Chrysanthemum Meets the Eagle," Issues in Science and Technology, Fall 2007.

(with A. Friedlander, J. Horrigan, and W. Lehr), Measuring Broadband: Improving Communications Policymaking through Better Data Collection, The Pew Internet and American Life Project, Washington, 2007.

"Moore's Law and the Economics of Leading Edge Semiconductors," Hitotsubashi University Institute for Innovation Research Working Paper WP#05-05, December 2004.

(with F. Weingarten) "The Economics of Fair Use and the Public Domain," Report Submitted to the Rockefeller Foundation, May 2004.

"New Economy Lite," in Issues in Science and Technology, Winter 2003

(with A. Aizcorbe and A. Kurshid),"The Role of Semiconductor Inputs in IT Hardware Price Decline: Computers vs. Communications," Federal Reserve Finance and Economics Discussion Paper 2002-37, (Washington: Board of Governors, The Federal Reserve Board), August, 2002.

"Failures of Defense Industrial Policy Reform and Likely Consequences for the Bush Defense Build-up," commissioned by Council on Foreign Relations, (March, 2002) available at http://www.cfr.org/public/GeoEcon_Military/index.html.

"U.S. Defense Industry in the Post-Cold War: Economic Pressures and Security Dilemmas," in Judith Reppy, Ed. The Place of Defense Industry in National Systems of Innovation, Occasional Paper #25, Cornell University Peace Studies Program, (Ithaca, NY: Cornell University Peace Studies Program), April 2000.

"Shaping science policy," Issues in Science and Technology, vol. XVI, No. 3, Spring 2000.

"Are New Global Rules Needed for High-Tech?", in A. Teich, S. Nelson, C. McEnaney, and S. Lita, Ed., AAAS Science and Technology Policy Yearbook 2000, (Washington: American Association for the Advancement of Science), 2000.

"Capital Markets and New Technologies: Introduction," in Charles W. Wessner, Ed., The Advanced Technology Program, Challenges and Opportunities, (Washington: National Academy Press), 1999.

"Discussion of The Government as Venture Capitalist," in Charles W.

Wessner, Ed., SBIR, Challenges and Opportunities, (Washington: National Academy Press), 1999.

"Discussion of Technology Transfer and the National Laboratories," in Charles W. Wessner, Ed., Industry-Laboratory Partnerships, A Review of the Sandia Science and Technology Park Initiative, (Washington: National Research Council), 1999.

"R&D in the Framework of the New Transatlantic Agenda," in Charles W. Wessner, Ed., New Vistas in Transatlantic Science and Technology Cooperation, (Washington: National Research Council), 1999.

(with E. Lincoln), "Reinvigorating APEC," in The International Economy,Vol.XII, No. 1, January-February 1998.

"An Economic Strategy to Control Arms Proliferation," Issues in Science and Technology, Vol. XIV, No.2, Winter 1997-1998.

More for Less: The Economic Impact of Semiconductors, (San Jose: Semiconductor Industry Association), December 1997.

(with E. Lincoln), Time to Reinvent APEC, Brookings Policy Brief No. 26,(Washington: Brookings Institution), November 1997.

Deciphering the Cryptography Debate, Brookings Policy Brief No. 21, (Washington: Brookings Institution), July 1997.

"Japan's New Semiconductor Technology Programs," Asia Technology Information Program Report No. ATIP 96.091, Tokyo, November 1996.

"FPD Sourcing Solution 'On Horizon'," New Technology Week, November 25, 1996.

International Armaments Cooperation in an Era of Coalition Security, (with others), Task Force on International Armaments Cooperation, Defense Science Board, Office of the Undersecretary of Defense (Acquisition and Technology), (Washington: Department of Defense), August, 1996.

Assessment of DoD Source Code Export Practices, (with others), Task Force on International Armaments Cooperation, Defense Science Board, Office of the Undersecretary of Defense (Acquisition and Technology), (Washington: Department of Defense), August, 1996.

"Semiconductors and Managed Trade," The Brookings Review, Summer1996.

“Controlling the Uncontrollable: Reforming U.S. Export Controls on Computers,” The Brookings Review, Winter 1996.

“In Defense of the Flat-Panel Display Initiative,” Issues in Science and Technology, Spring 1995.

“Flat-Panel Displays: Catalyzing a U.S. Industry,” Issues in Science and Technology, Fall 1994.

“Rules of the Game are Changing—Again.” Think, No. 2, Spring 1991.

"Making New Rules: High-Tech Trade Friction and the Semiconductor Industry," Brookings Review, Spring 1991.

"Review: Martin Campbell-Kelly, ICL: A Business and Technical History," Annals of the History of Computing, vol. 13, no. 1, 1991.

"Cooperation and Competition in the Global Computer Industry," prepared for the OECD, Directorate for Science and Industry, Paris, 1991.

"A Global View of Competition," Issues in Science and Technology, vol. 7, no. 2, Winter 1990-91.

"Patterns of Growth in the International Electronics Industry: Implications for Sectoral Strategy in Developing Countries," report for the World Bank, 1990.

"Strategic Aspects of Semiconductor Trade Policy," Research Institute of International Trade and Industry Working Paper No. 90-DOF-7, Ministry of International Trade and Industry, Japan, January 1990.

"Semiconductors and Pseudoscience," Issues in Science and Technology, vol. 6, no. 3, Spring 1990.

"The Computer Industry in Industrialized Economies: Lessons for the Newly Industrializing," World Bank, Industry and Energy Department Working Paper, Industry Series Paper No. 8, February 1989.

"Politics and Policy in the International Semiconductor Industry," in SEMI Twelfth Annual Information Services Seminar, (Mountain View: Semiconductor Equipment and Materials Institute), 1989.

"International Differences in Industrial Robot Use: Trends, Puzzles, and Possible Implications for Developing Countries," World Bank, Development Research Department Discussion Paper DRD185, July1986.