

Joseph Farrell

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Professor of Economics, University of California, Berkeley, since 1991
(Associate Professor 1989-1991);
Affiliated Professor, Haas School of Business, since 1994.

PREVIOUS POSITIONS:

Chair of the Competition Policy Center, 1999-2006.
Deputy Assistant Attorney General and Chief Economist, Antitrust Division,
US Department of Justice, July 2000-June 2001.
Chief Economist, Federal Communications Commission, January 1996-June 1997.
National Fellow, Hoover Institution, Stanford University, 1988-9.
Visiting Assistant Professor, University of California, Berkeley, 1986-8.
Principal Member, Technical Staff, GTE Laboratories, 1985-6.
Senior Member, Technical Staff, GTE Laboratories, 1984-85.
Assistant Professor of Economics, MIT, 1980-84.
Instructor, MIT, 1979-80.
Visitor, Bell Laboratories, summer 1978.
Visiting Assistant Professor, University of California, San Diego, spring 1983.

EDUCATION:

D.Phil., economics, Oxford University, 1981.
Thesis title, "Prices as Signals of Quality."
Advisors: James A. Mirrlees and Joseph E. Stiglitz.
M.Sc., mathematics, Oxford University, 1976.
Advisors: M.F. Atiyah and P.M. Neumann.
B.A., mathematics, First Class Honours, Oxford University, 1975.

TEACHING EXPERIENCE:

Graduate and undergraduate industrial organization, regulation and antitrust, competitive strategy, microeconomics, statistical decision theory, and game theory, at Massachusetts Institute of Technology, University of Michigan, University of California at Berkeley and at San Diego.

PUBLICATIONS

- “Standardization, Compatibility and Innovation,” *Rand Journal of Economics* **16** (Spring 1985) 70-83 (with Garth Saloner).
Reprinted in *The Economics of Information*, Steven Lippman and David K. Levine, eds., *International Library of Critical Writings in Economics*, Elgar.
- “Owner-Consumers and Efficiency,” *Economics Letters* **19** (1985) 303-306.
- “How Effective is Potential Competition?” *Economics Letters* **20** (1986) 67-70.
- “Standardization and Variety,” *Economics Letters* **20** (1986) 71-74 (with Garth Saloner).
- “Voluntary Disclosure: Robustness of the Unraveling Result,” in *Antitrust and Regulation*, R. Grieson, ed., Lexington Books (1986), 91-103.
- “A Note on Inertia in Market Share,” *Economics Letters* **21** (1986) 73-75.
- “Moral Hazard as an Entry Barrier,” *Rand Journal of Economics* **17** (1986), 440-449.
- “Economic Issues in Standardization,” in *Telecommunications and Equity: Policy Research Issues*, J. Miller, ed., North-Holland (1986), 165-178 (with Garth Saloner).
- “Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation,” *American Economic Review* **76** (December 1986), 940-955 (with Garth Saloner).
Reprinted in *The Economics of Innovation Policy*, Albert Link, ed., *International Library of Critical Writings in Economics*, Elgar, 2008.
- “Experience Rating and Premium Risk,” *Economics Letters* **21** (1986), 311-314.
- “Cheap Talk, Coordination and Entry,” *Rand Journal of Economics* **18** (1987), 34-39.
Reprinted in Eric Rasmusen, *Readings in Games and Information*. Oxford: Blackwell (2001).
Reprinted in Yanis Varoufakis and Anthony Housego, editors, *Game Theory: Critical Concepts in the Social Sciences*, Routledge (2001).
- “Rigidity versus License,” *American Economic Review* **77** (March 1987), 195-197.
- “Competition, Compatibility and Standards,” pages 1-18 in *Product Standardization and Competitive Strategy*, H. Landis Gabel, ed., North-Holland, 1987 (with Garth Saloner).
- “Competition with Lock-In,” pages 353-362 in *Telecommunications Demand Modeling: An Integrated View*, de Fontenay, Shugard and Sibley (eds.), North-Holland, 1990.

- “Partnerships,” *Quarterly Journal of Economics* **103** (May 1988), 279-297 (with Suzanne Scotchmer).
- “Information and the Coase Theorem,” *Journal of Economic Perspectives* **1** (1987), 113-129.
Reprinted (in part) in S. Baker and C. Elliott, eds., *Economics of the Public Sector: Readings and Commentary*, Lexington, Mass: Heath, 1989.
- “Dynamic Competition with Switching Costs,” *Rand Journal of Economics* **19** (Spring 1988), 123-137 (with Carl Shapiro).
- “Puzzles: Sylvia, Ice Cream, and More,” *Journal of Economic Perspectives*, **2**, Summer 1988, 175-182.
- “Coordination Through Committees and Markets,” *Rand Journal of Economics* **19** (Summer 1988) 235-252 (with Garth Saloner).
- “Communication, Coordination, and Nash Equilibrium,” *Economics Letters* **27:3** (1988) 209-214; misprint corrected in *Economics Letters* **33:3** (July 1990) 299.
- “Cheap Talk Can Matter in Bargaining,” *Journal of Economic Theory* **47** (1989), 221-237 (with Robert Gibbons).
Reprinted in *Bargaining with Incomplete Information*, P. Linhart, R. Radner, and M. Satterthwaite, eds., Academic Press, 1992.
- “Second-Sourcing as a Commitment: Monopoly Incentives to Attract Competition,” *Quarterly Journal of Economics* **103** (November 1988), 673-694 (with Nancy T. Gallini).
- “Optimal Contracts with Lock-In,” *American Economic Review* **79:1** (March 1989) 51-68 (with Carl Shapiro).
- “Competition Between and Within Teams: The Lifeboat Principle,” *Economics Letters* **29** (1989), 205-208 (with Eric Lander).
- “Standardization and Intellectual Property,” *Jurimetrics Journal* **30:1** (Fall 1989), 35-50.
Reprinted in P. Drahos, ed., *Intellectual Property*, Essays in Law and Legal Theory, 1999.
Reprinted in R. Towse and R. Holzhauser, eds., *The Economics of Intellectual Property* (International Library of Critical Writings in Economics).
- “Evolutionary Stability in the Repeated Prisoner’s Dilemma,” *Theoretical Population Biology* **36** (October 1989), 161-166 (with Roger Ware).
- “Renegotiation-Proof Equilibrium: Reply,” *Journal of Economic Theory* **49** (December 1989),

- 376-378 (with Eric Maskin).
- “Cheap Talk with Two Audiences,” *American Economic Review* **79** (December 1989), 1214-1223 (with Robert Gibbons).
- “Horizontal Mergers: An Equilibrium Analysis,” *American Economic Review* **80**:1 (March 1990), 107-126 (with Carl Shapiro).
Reprinted in *Takeovers Volume I*, A. Cosh and A. Hughes, eds., International Library of Management.
Reprinted in *Applied Industrial Economics*, L. Philips, Cambridge Univ. Press.
Reprinted in *Recent Developments in Monopoly and Competition Policy*, George Norman, ed., International Library of Critical Writings in Economics, Edward Elgar (2008).
- “Renegotiation in Repeated Games,” *Games and Economic Behavior* **1** (December 1989), 327-360 (with Eric Maskin).
Reprinted in *International Library of Critical Writings in Economics: Recent Developments in Game Theory*, Edward Elgar 1999: 388-421.
- “Asset Ownership and Market Structure in Oligopoly,” *Rand Journal of Economics* **21** (Summer 1990), 275-292 (with Carl Shapiro).
- “The Economics of Standardization: A Guide for Non-Economists,” in J. L. Berg and H. Schumny, eds., *An Analysis of the Information Technology Standardization Process: Proceedings of the International Symposium on Information Technology Standardization, INSITS*. Amsterdam: North-Holland, 1990, pp 189-198.
- “Decentralization, Duplication, and Delay,” *Journal of Political Economy* **98** (August 1990), 803-826 (with Patrick Bolton).
- “One-Sided Patience with One-Sided Communication Does Not Justify Stackelberg Equilibrium,” *Games and Economic Behavior* **2** (1990), 299-303 (with Eddie Dekel).
- “Horizontal Mergers and Antitrust Policy: Reply,” *American Economic Review* **81** (September 1991), 1007-1011 (with Carl Shapiro).
- “The Role of the ITU in Standardization: Pre-Eminence, Impotence, or Rubber Stamp?” *Telecommunications Policy*, August 1991, 311-321 (with Stanley M. Besen).
- Book Review: *Changing the Rules: Technological Change, International Competition, and Regulation in Telecommunications* (ed. R. Crandall and K. Flamm), *Journal of Economic Literature* **29** (September 1991), 1204-1205.
- Discussion of article by Franklin M. Fisher, *Brookings Papers on Economic Activity: Microeconomics*, 1991, 231-240.

- “Converters, Compatibility and the Control of Interfaces,” *Journal of Industrial Economics* **40**:1 (March 1992), 9-36 (with Garth Saloner).
- “Standard Setting in High-Definition Television,” *Brookings Papers on Economic Activity: Microeconomics*, 1992, 1-93 (with Carl Shapiro).
- “The Dynamics of Bandwagons,” in *Problems of Coordination in Economic Activity*, edited by James W. Friedman: Kluwer, 1993 (with Carl Shapiro).
- “Meaning and Credibility in Cheap-Talk Games,” *Games and Economic Behavior* **5** (October 1993), 514-531.
Reprinted in *Mathematical Models in Economics*, edited by Michael Bacharach and Michael Dempster, Oxford University Press, 1997.
- “Choosing How to Compete: Strategy and Tactics in Standardization” (with Stanley M. Besen); *Journal of Economic Perspectives*, **8** (Spring 1994), 117-131.
- “Irrational Behavior in the AT&T Investment Game,” *Economics Letters* **45**:4 (August 1994), 471-474 (with Suzanne Scotchmer).
- “Cheap Talk about Specific Investments,” *Journal of Law, Economics, and Organization* **11**:2 (1995) (with Robert Gibbons).
- “Some Arguments for Weaker Intellectual Property Protection in Network Industries,” *StandardView* **3**:2 (June 1995): 46-49.
Reprinted in *Standards Policy and Information Infrastructure*, edited by Brian Kahin and Janet Abbate (MIT Press, 1995), 368-377.
- “The Economic Role of Standards,” in *The Changing Nature of Telecommunications/Information Infrastructure*, National Academy Press, 1995.
- “Talk is Cheap,” *American Economic Review* **85**:2 (May 1995), 186-190.
- “Brief Amicus Curiae” to Supreme Court, *Lotus v. Borland*, Dec. 1995. Written with Glenn Woroch; signed by 13 other economists: <http://www.softwareindustry.org/issues/docs/htm/brf-econ.html>
- “Harnesses and Muzzles: Greed as Engine and Threat in the Standards Process,” *StandardView* **4**:1 (March 1996), 29-31; available at: <http://www.acm.org/pubs/articles/journals/standardview>.
Reprinted in *The Standards Edge*, Carl Cargill, editor, 2002.
- “Cheap Talk,” *Journal of Economic Perspectives* **10**:3 (Summer 1996), 103-118 (with Matthew Rabin).

- “Creating Local Competition,” *Federal Communications Law Journal* **49**:1 (November 1996): 201-215.
- “Prospects for Deregulation in Telecommunications,” *Industrial and Corporate Change*, **6**:4 (December 1997): 719-740.
- “Public Policy and Private Investment in Advanced Telecommunications Infrastructure,” *IEEE Communications Magazine*, **36**:7 (July 1998): 87-92 (with Michael L. Katz).
- “The Vertical Structure of Industry: Systems Competition versus Component Competition” (with Hunter Monroe and Garth Saloner), *Journal of Economics and Management Strategy* **7**:2 (Summer 1998), 143-182.
- “Cheap Talk and Coordination”, in *The New Palgrave Dictionary of Economics and the Law*, edited by Peter Newman. McMillan, 1998, pp 224-227.
- Discussion of article by Church and Ware, in *Competition Policy and Intellectual Property Rights in the Knowledge-Based Economy*, R. Anderson and N.T. Gallini, editors. University of Calgary Press (Industry Canada series), 1998.
- “The Effects of Antitrust and Intellectual Property Law on Compatibility and Innovation,” *Antitrust Bulletin*, Fall/Winter 1998, 609-650 (with Michael L. Katz).
- “Inside the Pin Factory: Empirical Studies Augmented by Manager Interviews,” *Journal of Industrial Economics* **46**:2 (June 1998) 123-124, editorial introduction (with Severin Borenstein and Adam Jaffe).
- “Using Cost-Cutting Announcements to Diagnose X-Inefficiency,” *American Economic Review*, **90**:2 (May 2000) (with Severin Borenstein).
Reprinted in National Bureau of Economic Research, *Industrial Technology and Productivity: Incorporating Learning from Plant Visits and Interviews into Economic Research*, 2000.
- “Renegotiation in Repeated Oligopoly Interaction,” in *Incentives, Organisation, and Public Economics: Papers in Honour of Sir James Mirrlees*, edited by Gareth Myles and Peter Hammond, Oxford University Press, 2000.
- “The Professor and the Madmen: Review of *New Palgrave Dictionary of Economics and the Law*,” *Economic Journal*, November 2000.
- “Innovation, Rent Extraction, and Integration in Systems Markets” *Journal of Industrial Economics* **48**:4 (December 2000), 413-432 (with Michael L. Katz).
- “Scale Economies and Synergies in Horizontal Merger Analysis,” *Antitrust Law Journal* **68**: 685-710 (2001) (with Carl Shapiro).

Speeches as Deputy Assistant Attorney General:

http://www.usdoj.gov/atr/public/speeches/speech_farrell.htm

“Monopoly Slack and Competitive Rigor,” in Eric Rasmusen, *Readings in Games and Information*. Oxford: Blackwell Publishing (2001).

“Renegotiation in the Repeated Amnesty Dilemma, with Economic Applications,” in *Business Applications of Game Theory*, edited by Kalyan Chatterjee and William Samuelson, Kluwer, 2001 (with Georg Weizsäcker): <http://www.springerlink.com/content/v64865/>.

“Market Structure, Organizational Structure, and R&D Diversity,” pp. 195-220 in Richard Arnott et al., eds., *Economics for an Imperfect World: Essays in Honor of Joseph E. Stiglitz*, MIT Press (2003) (with Richard Gilbert and Michael L. Katz).

“The American Airlines Case: A Chance to Clarify Predation Policy,” in John Kwoka and Lawrence White, editors, *The Antitrust Revolution*, 4th edition, Oxford University Press (2003), 502-527 (with Aaron Edlin).

“Integration and Independent Innovation on a Network,” *American Economic Review, Papers and Proceedings*, **93**:2 (May 2003), 420-424.

“Negotiation and Merger Remedies: Some Problems,” in *Merger Remedies in American and European Union Competition Law*, Francois Leveque and Howard Shelanski, eds., Edward Elgar, 2003.

“Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age,” *Harvard Journal of Law and Technology* **17**:1 (Fall 2003), 85-135 (with Philip Weiser): <http://jolt.law.harvard.edu/p.cgi/articles/v17.html>

“Listening to Interested Parties in Antitrust: Competitors, Customers, Complementors, and Relativity,” *Antitrust* **18**:2 (Spring 2004), 64-68.

THE ECONOMICS OF INFORMATION TECHNOLOGY, Cambridge University Press, December 2004 (with Hal Varian and Carl Shapiro). Translations into Chinese and Italian. <http://www.cambridge.org/uk/catalogue/catalogue.asp?isbn=0521605210>.

“Incentives to Challenge and Defend Patents: Why Litigation Won’t Reliably Fix Patent Office Errors, and Why Administrative Patent Review Might Help,” *Berkeley Technology Law Journal* **19**:3 (Spring/Summer 2004), with Robert P. Merges. Available at: http://btlj.boalt.org/data/articles/19-3_spring-2004_symp_6-farrell-merges.pdf

- “Competition or Predation? Consumer Coordination, Strategic Pricing, and Price Floors in Network Markets,” with Michael L. Katz, *Journal of Industrial Economics* **53**:2 (June 2005), 203-231.
- “Innovation and Regulation” (invited review of part of *Economic Report of the President*), *Journal of Economic Literature* **43** (September 2005), 801-805.
- “Deconstructing Chicago on Exclusive Dealing,” *The Antitrust Bulletin* **50**:3 (2005), 465-480.
- “Amicus Brief of 37 Business, Economics and Law Professors” in Tamoxifen Citrate antitrust litigation, December 2005, written together with Mark Lemley and Carl Shapiro, also signed by 34 other professors of business, economics and law.
- “Assessing Australian Interchange Regulation: Comments on Chang, Evans and Garcia Swartz,” *Review of Network Economics* **4**:4 (Dec. 2005): 359-363. <http://www.rnejournal.com>.
- “Complexity, Diversity, and Antitrust,” *The Antitrust Bulletin* **51**:1 (Spring 2006): 165-173.
- “Open Access Arguments,” chapter 6 (pp. 195-214) in *Net Neutrality or Net Neutering: Should Broadband Services be Regulated?* edited by Thomas Lenard and Randolph May, Springer, 2006: <http://www.springerlink.com/content/h2wh8g/> .
- “Efficiency and Competition among Payment Instruments,” *Review of Network Economics* **5**:1 (March 2006), 26-44. <http://www.rnejournal.com>.
- “The Economics of Welfare Standards in Antitrust,” *Competition Policy International* **2**:2 (Autumn 2006), 3-28, with Michael L. Katz: www.esapience.org.
- “Compatibility and Competition Policy,” chapter 12 (pp. 372-388) in *STANDARDS AND PUBLIC POLICY*, Cambridge University Press 2007, Shane Greenstein and Victor Stango, editors.
- “Do Investors Forecast Fat Firms? Diagnosing Profit Dissipation from Stock Market Values of Gold Mining Firms,” *RAND Journal of Economics* **38**:3 (Autumn 2007), 626-647, with Severin Borenstein.
- “Coordination and Lock-In: Competition with Switching Costs and Network Effects” (with Paul Klemperer), in *HANDBOOK OF INDUSTRIAL ORGANIZATION*, volume **3** (2007), Elsevier, edited by Mark Armstrong and Robert Porter, pp. 1967-2072.
- “Standard Setting, Patents, and Hold-Up,” *Antitrust Law Journal* **74**:3 (Fall 2007), 603-670 (with John Hayes, Carl Shapiro, and Theresa Sullivan).
- “How Strong Are Weak Patents?” *American Economic Review* **98**:4 (September 2008), 1347-1369, with Carl Shapiro.

“Improving Critical Loss Analysis,” with Carl Shapiro, *Antitrust Source*, February 2008, www.antitrustsource.com.

“Merger to Monopoly to Serve a Single Buyer: Comment,” *Antitrust Law Journal* **75:2** (Summer 2008), 637-646, with Jonathan Baker and Carl Shapiro.

“Intellectual Property as a Bargaining Environment,” in *INNOVATION POLICY AND THE ECONOMY*, National Bureau of Economic Research/University of Chicago Press, Josh Lerner and Scott Stern, eds., 2008.

PROFESSIONAL ACTIVITIES AND HONORS:

Fellow, Econometric Society (elected 2002).

Chair, Competition Policy Center, 1999-2006. See <http://iber.berkeley.edu/cpc/>.

Board Member, Computer Science and Telecommunications Board, National Academy of Sciences, 2001-2004.

Editor, *Journal of Industrial Economics*, 1995-2000 (previously Associate Editor).

Board of Editors, *Information Economics and Policy*, 2004-2007.

President, Industrial Organization Society, 1996.

Vice-Chair, Economics Committee, Antitrust Section, American Bar Association, 2001.

“**Highly Cited Researcher**” Economics/Business, ISI (<http://isihighlycited.com>).

Refereeing for *American Economic Review*, *Bell Journal of Economics*, *Econometrica*, *Economic Inquiry*, *Economica*, *European Journal of Operational Research*, *Games and Economic Behavior*, *Industrial and Corporate Change*, *Information Economics and Policy*, *International Economic Review*, *International Journal of Game Theory*, *International Journal of Industrial Organization*, *Journal of Economic Dynamics and Control*, *Journal of Economic Theory*, *Journal of Economics and Business*, *Journal of Economics and Management Strategy*, *Journal of Law and Economics*, *Journal of Law, Economics and Organization*, *Journal of Macroeconomics*, *Journal of Money, Credit, and Banking*, *Journal of Political Economy*, *Journal of Public Economics*, *Journal of Public Policy and Management*, *Management Science*, *Mathematical Social Science*, *Oxford Economic Papers*, *Quarterly Journal of Economics*, *Quarterly Review of Economics and Business*, *Rand Journal of Economics*, *Review of Economic Studies*, *Science*, *Theoretical Population Biology*, for Blackwell, Harvard University Press, Kluwer, MIT Press, Princeton University Press, the Rand Corporation, the National Science Foundation, Canadian Social Science Research Council, UC Energy Research Group.

Academic Advisory Boards

Consortium on Telecommunications Policy (1997)
Power and Telecom (1997-1999)
Economics of Innovation and New Technology (1990-1995)
Centre for Competition Policy (UK), since 2004.

Seminar Presentations at American Bar Association, American Enterprise Institute, Australian Competition and Consumer Commission, Barcelona, Boston University, Brookings, Cal Tech, California Public Utilities Commission, Calgary, Cambridge University, Columbia, University of Chicago, European Commission DG Competition, University of East Anglia, Federal Communications Bar Association, Federal Communications Commission, Federal Reserve Board, Federal Trade Commission, Harvard, Georgetown (Business School; Law School), George Washington University, Goldman Sachs, LSE, MIT, Melbourne, Michigan, NBER, Nokia, Northwestern, Norwegian School of Management, Oslo University, Oxford, Princeton, Progress and Freedom Foundation, Santa Fe Institute, Stanford, Tel Aviv, Arizona, British Columbia, University of California (Berkeley, Davis, Los Angeles, San Diego, Santa Barbara, Santa Cruz), Iowa, National Economists' Club, New University of Lisbon, USC, Toronto, Toulouse, Washington, US Department of Justice, US Treasury, Canadian Bureau of Competition Policy, National Association of Attorneys General, National Research Council, OECD, World Bank, UK Competition Commission, Office of Fair Trading (UK), and numerous conferences.

Co-Chair, American Bar Association conference on antitrust in high technology, June 2005.
Faculty, New York University graduate workshop on economics of technology, June 2005.

Organized the GTE Laboratories Economics Symposium, August 1985.
Organizing Committee, Telecommunications Policy Research Conference, April 1986.
Program Committee, Econometric Society, June 1992; American Economic Association, January 2000.
Scientific Committee, Toulouse, 2004.

Reviewer, U. S. Office of Technology Assessment:
"Computer Software and Intellectual Property", *Finding a Balance*, 1992.
Global Standards: Building Blocks for the Future, March 1992.

Reviewer, National Academy of Sciences/National Research Council.
Witness, US Senate Judiciary Committee, FCC, FTC, and DOJ hearings.

University and departmental administrative service including past service as Chair of the Competition Policy Center, Chair of the Graduate Committee, membership of the Personnel Committee and Undergraduate Committee, promotion and tenure committees, and *ad hoc* committees.

Senior Consultant, Charles River Associates, since 2003. **Consultant** for Department of Justice, Federal Trade Commission, Reserve Bank of Australia, and private parties.

SCHOLARSHIPS AND GRANTS

Open Scholarship in Mathematics (undergraduate) 1972-1975.
College Book Prize for academic performance, 1974.
University Prize for final examinations in mathematics, 1975.
Taberdar Senior Scholarship [awarded to one to two graduate students in all subjects], 1975-76.
Science Research Council Studentship, 1975-78.
Amphlett Senior Scholarship [one of six in all subjects], 1976-78.
Hulme Senior Scholarship [one of three in all subjects], 1978-79.
University Prize for best economics master's thesis, 1979.
Principal Investigator, NSF, "Economics of Compatibility Standards and Lock-In," 1987-89.
National Fellow, Hoover Institution, Stanford University, 1988-9.

Co-Principal Investigator (with Carl Shapiro), NSF grant, "The Evolution of Network Industries," 1989-91.
Hewlett Fund grant, Institute of International Studies, Berkeley, 1990-91.
Co-Principal Investigator (with Carl Shapiro), NSF, "Technology Transitions with Network Externalities," 1992-94.
Sloan Foundation/NBER grant (with Severin Borenstein), "Why Do Firms Cut Costs?" 1998-2000.
Gordon Cain Senior Fellow, SIEPR, 2001-2002.