

Geoffrey Heal. Curriculum Vitae.

January 2020

Position: **Donald C. Waite Professor of Social Enterprise and Professor of Economics and Finance, Graduate School of Business, Columbia University, and Professor, School of International and Public Affairs.**

Office: Graduate School of Business,
320 Uris Hall
Columbia University, New York, NY 10027
Phone: 212-854-6459, Fax: 212-316 9219
E-mail: gmdl@gsb.columbia.edu
Web – www.geoffreyheal.com

Personal: Married, two children.
Conversational French and German.

Education:

1963-1966 Churchill College, Cambridge. College Entrance Scholar in Physics. Studied Physics, then Economics. BA with First Class Honors.

1966-67 Flood Fellow, University of California, Berkeley, California.

1967-68 Doctoral Student, Churchill College, Cambridge.

1969 Ph.D. in Economics, Cambridge University.
Thesis Title: "Planning without Prices."

Fields of Specialization:

Economics of Natural Resources and the Environment
Economic Theory & Mathematical Economics
Regulation and Increasing Returns
Resource Allocation under Uncertainty

Academic Positions (permanent):

1968-73 Fellow of Christ's College, Cambridge.

1969-73 Director of Studies in Economics, Christ's College, Cambridge.

1969-73 University Assistant Lecturer in Economics, Cambridge University

1973-80 Professor of Economics, University of Sussex.

- 1980-83 Professor of Economics, University of Essex.
- 1983 on Professor of Economics, Columbia Business School.
- 1991-94 Senior Vice Dean, Columbia Business School. Chief Academic Officer of the School, responsible for all matters relating to a full-time faculty of 100 and related support services including secretarial & administrative staff and computing services. Responsible for radical overhaul of MBA curriculum, of computer systems and their use in teaching & research, and of process of faculty governance and faculty performance evaluation.
- 1995 Paul Garrett Professor of Public Policy and Business Responsibility, Columbia Business School.
- 1995-99 Academic Director, Executive MBA Program, Columbia Business School.
- 2002 - Professor, School of International and Public Affairs
- 2010 - Donald Waite III Professor of Social Enterprise, Columbia Business School

Academic Positions (visiting):

- 1972 Research Staff Economist, Cowles Foundation for Research in Economics, Yale University.
- 1975 Visiting Professor of Economics, Yale University (fall).
- 1976 Visiting Professor of Economics, Stanford University.
- 1978 Visiting Professor of Economics, Université de Paris XII.
- 1979 Wesley Clair Mitchell Research Professor of Economics, Columbia University.
- 1980 UK Social Science Research Council Professorial Fellowship.
- 1982 Visiting Scholar, International Institute for Applied Systems Analysis (IIASA), Austria.
- 1982 Visiting Professor of Economics, Yale University.
- 1983 Visiting Professor of Economics, Princeton University.
- 1983 Visiting Professor of Economics, University of Stockholm.
- 1984 Visiting Professor, Institute for Mathematics and it Applications, University of Minnesota.
- 1992 Visiting Professor, University of Siena.

- 1993 Visiting Professor, University of Siena.
- 1997 Fulbright Professor, University of Siena.
- 1997 Visiting Professor, Universite de Paris X Nanterre.
- 1998 Visiting Scholar, Center for Environmental Science and Policy, Stanford University.
- 2009 Visiting Scholar, London School of Economics, Grantham Research Institute

Professional Positions:

- 1969-80 Member of the Editorial Board, Review of Economic Studies.
- 1971-75 Managing Editor, Review of Economic Studies.
- 1973-80 Member of the European Programme Committee of the Econometric Council.
- 1974-79 Member of the Economics Committee of the UK Social Sciences Research Council.
- 1978 on Member of the Editorial Board, Economics Letters.
- 1978 on Member of the Editorial Board, Energy and Resource Economics.
- 1978-79 Member, Steering Committee of US National Academy of Sciences Project on “Resource and Environmental Constraints of Economic Growth.”
- 1980 Program Co-chair, European Meetings of the Econometric Society.
- 1981 Member, Advisory Committee, Systems and Decisions Sciences Area, International Institute of Applied Analysis (IIASA), Austria.
- 1981-85 Associate Editor, Econometrica.
- 1985 on Associate Editor, Social Choice and Welfare.
- 1992 on Associate Editor, Resources and Energy Economics.
- 1992-1995 Chair, Economics Advisory Committee, NOAA.
- 1993 on Associate Editor, Journal of International and Comparative Economics.
- 1993 Associate Editor, Economics of Environmentally Sustainable Development.
- 1994 Participant, White House Conference of Environmental Policy.

- 1997 Member, President's Committee of Advisors on Science and Technology (PCAST), subcommittee on biodiversity.
- 1999 Member of the Board, Union of Concerned Scientists.
- 1999 Director, Beijer Institute of the Royal Swedish Academy of Sciences 1999-2004
- 2000 Commissioner, Pew Oceans Commission. 2000-2003
- 2001 International Research Fellow of the [Kiel Institute of World Economics](#)
- 2002 Chair, National Academy of Sciences-National Research Council Committee on the economic valuation of ecosystem services. 2002-2005
- 2003 Member, Science Advisory Board of the U.S. Environmental Protection Agency
- 2004 Chairman of the Board, Coalition for Rainforest Nations.
- 2007 Managing Editor, Social Science Research Network, Environmental Impacts of Business Abstracts, Sponsored by Aspen Institute Business and Society Program
- 2008 Member of the Committee on the Measurement of Economic Performance and Social Progress constituted to advise President Sarkozy of France on the reform of the measurement of national income, chair of the subgroup on sustainability.
- 2008 Editorial Board, Review of Environmental Economics and Policy
- 2011 Coordinating Lead Author, Working Group II, Intergovernmental Panel on Climate Change
- 2013 Member, High Level Experts Group on the Measurement of Economic Performance and Social Progress of the Organization for Economic Cooperation and Development.
- 2018 Section Liaison, National Academy of Sciences
- 2018 Member Editor of Proceedings of the National Academy of Sciences

Honors:

- 1976 Ruben Gustavson Memorial Lecturer, University of Chicago.
- 1977 Elected Fellow of the Econometric Society.
- 1977 Invited Plenary Speaker, Fourth World Congress of the International Economic Association, Tokyo, Japan.

- 1979 Invited Plenary Speaker, Arbeitstagung der Verein fur Sozialpolitik, Mannheim, Germany.
- 1980 Elected President-Elect, Association of Environmental & Resource Economists.
- 1982 President, Association of Environmental & Resource Economists.
- 1983 Listed in Who's Who in Economics, a biographical listing of the 400 most-cited economists. New edition published in 2000.
- 1994 Invited Plenary Speaker, Canadian Association of Social Scientists, Ottawa, Canada.
- 1994 Invited Plenary Speaker, International Forum on Uncertainty and Risk, Oslo, Norway.
- 1995 Lief Johansen Lecturer, University of Oslo and Central Bank of Norway.
- 1996 Invited Plenary Speaker, European Association of Environmental and Resource Economists.
- 1997 Fulbright Professor of Economics, University of Siena.
- 1997 Commencement Speaker, University of California at Berkeley, College of Natural Resources.
- 2005 Invited Plenary Speaker, World Congress of the International Economic Association, Buenos Aires.
- 2006 Member of the Board, Union of Concerned Scientists.
- 2001 Plenary Speaker, Congress of the European Association of Environmental and Resource Economists.
- 2001 International Fellow, Kiel Institute for World Economics
- 2004 Recipient of the Association of Environmental and Resource Economist's *Award for Publication of Enduring Quality* for the book *Economic theory and Exhaustible Resources* (with Dasgupta), Cambridge University Press, 1979.
- 2007 Fellow, Association of Environmental and Resource Economists
- 2008 Honorary Doctorate, Université de Paris Dauphine
- 2014 Recipient of Best Paper of 2013 Award, European Association of Environmental and Resource Economists
- 2016 Elected Member, United States National Academy of Sciences

Listed in Who's Who in Industry and Finance, Who's Who in Education, and Who's Who in the East, Who's Who in Science and Technology, Who's Who in the USA, Who's Who in the World and Who's Who in Economics

Outside Activities:

Consultant on various occasions to:

UK Department of the Environment (on measuring preferences for environmental quality.)

UK Department of Industry (on waste management & recycling.)

US Federal Energy Administration (on modeling energy use.)

US Electric Power Research Institute (on allocation of funds between alternative R&D projects.)

UK Office of Fair Trading (on welfare impact of retail trading practices.)

UK Department of Energy (on estimating energy demand systems for the UK.)

Organization of Petroleum Exporting Countries (OPEC) (on modeling world oil market.)

Phillips Petroleum (on pricing of North Sea Gas.)

US Internal Revenue Service (on tax shelters & commodity markets.)

H.E. The Secretary General, United Nations Conference on Trade & Development (UNCTAD).

United Nations Institute of Training & Research (UNITAR) (on energy use in developing countries.)

United Nations Conference on Trade & Development on International Environmental Policy.

Organization for Economic Cooperation and Development on International Environmental Policy.

Global Environmental Facility

United Mine Workers of America

International Brotherhood of Teamsters

The World Bank

Director and Co-owner, Economists Advisory Group (consulting firm), 1977-82.

Associate, Economist Intelligence Unit (consultancy arm of The Economist magazine), 1981-84. (The Economists Advisory Group merged with the Economist Intelligence Unit.)

Founder, Director and President, FITEL Ltd. (providing computer & communications services to the international securities industry), 1985-89. Now owned by Lucent Technologies.

Director, Union of Concerned Scientists, 2003 on. Member of the Finance Committee, Audit Committee, Strategy Committee and Governance Committee

Founder and Board Member, Coalition for Rainforest Nations, 2005 on. Chairman of the Board, 2012 on.

Founder and Board Member, Rainforest Nations Conservation Association, 2005 on. Chairman of the Board, 2012 on.

Director, Petromin Holdings PNG Ltd. (The national oil, gas and mineral company of Papua New Guinea) 2007-2009.

Coordinating Lead Author, Working Group II, Intergovernmental Panel on Climate Change, 2010 to 2014

Member of the Investment Committee, The Eco Products Fund (a private equity group), 2007-2010

Member of the Board, Public Business Media, 2011-15.

Advisor to the World Bank on Green Growth, 2010 to 2016.

Expert witness on corporate responsibility to Bucci Bailey and Javins L.C., 2011-2012: 2014.

2013-2018 Member of the Advisory Board, The Green Seal

2013 on: Member of the Economic Advisory Board of Environmental Defense Fund

Teaching Experience:

Microeconomics at all levels from first year undergraduate to advanced Ph.D., including extensive MBA and executive micro teaching.

Awarded Executive MBA Teaching Award, 1992.

Awarded Social Enterprise Program Teaching Award 2005

Resource and environmental economics to undergraduate, MBA and graduate audiences.

The International Oil Market.

International Economics.

Mathematical Economics.

Public Sector Economics & Regulation.

Corporate Social Responsibility

Current Developments in Energy Markets

Books Published:

- 1 The Theory of Economic Planning, North Holland Publishing Co., 1973. Italian and Spanish translations published 1975. Japanese translation 1995.
- 2 Linear Algebra & Linear Economics. Macmillan, 1974.
- 3 Economic Theory & Exhaustible Resources. Cambridge University Press, 1979. Reprinted five times.
- 4 Public Policy & the Tax System: Essays in Honour of J.E. Meade. (co-editor), Allen & Unwin, 1980. Spanish translation.
- 5 The Evolving International Economy, Cambridge University Press, 1987.
- 6 Oil and the International Economy, Oxford University Press, 1991.
- 7 The Economics of Exhaustible Resources. The International Library of Critical Writings in Economics, Edward Elgar, 1993.
- 8 Sustainability: Dynamics and Uncertainty (co-editor). Kluwer Academic Publishers, for Fondazione ENI Enrico Mattei, 1997.
- 9 Topological Social Choice, (editor) Springer Verlag, 1997
- 10 Valuing the Future: Economic Theory and Sustainability. Columbia University Press, 1998.
- 11 The Economics of Increasing Returns, (editor) The International Library of Critical Writings in Economics, Edward Elgar, 1999.
- 12 Environmental Markets (co-editor) Columbia University Press, 2000.
- 13 Nature and the Marketplace. Island Press, 2000. (Japanese translation 2006, Chinese 2007)

- 14 America's Living Oceans: Setting a Course for Change, report of the Pew Oceans Commission, 2003.
- 15 Valuing Ecosystem Services, Editor, Report of the National Research Council/National Academy of Sciences, 2004.
- 16 When Principles Pay: Corporate Social Responsibility and the Bottom Line. Columbia Business School Press, 2008
- 17 The Sustainability of Economic Growth, (editor), International Economic Association/Palgrave, 2009.
- 18 Endangered Economies: Why the Neglect of Nature Threatens Our Prosperity, Columbia University Press, 2016.

Articles published or in working paper form:

On Resource and Environmental Economics:

- 1 "The Depletion of Exhaustible Resources," in *Essays in Modern Economics*, edited by M. Parkin, Longmans, 1974.
- 2 "The Optimal Depletion of Exhaustible Resources," (with P.S. Dasgupta), *Review of Economic Studies*, Symposium on the Economics of Exhaustible resources, 1974, pp. 3-28. Reprinted in V.L. Smith (ed.) *Readings in the Economics of Resources*.
- 3 "Economic Aspects of Natural Resource Depletion," in *The Economics of Resource Depletion*, edited by D.W. Pearce for the Social Science Research Council, Macmillian, 1974.
- 4 "The Relationship between Interest Rates and Metal Price Movements," *Review of Economic Studies*, January, 1980, XLVII, pp. 161-181.
- 5 "The Relationship Between Price and Extraction Cost for a Resource with a Backstop Technology," *The Bell Journal of Economics & Management Science*, 1976, 7,2, pp. 371-378.
- 6 "Resource Management in a Trading Economy" (with P.S. Dasgupta & R.K. Eastwood), *The Quarterly Journal of Economics*, 1978.
- 7 "Resource Depletion & Research & Development," (with P.S. Dasgupta & M.K. Majumdar) in M.D. Intriligator (ed.) *Frontiers of Quantitative Economics*, Vol. IIIB, Chapter 12A, pp. 483-505. North Holland Publishing Co., 1976.
- 8 "Does the Price System Work for Resources?" Reuben Gustavson Memorial Lecture, University of Chicago, 1976.

- 9 “Uncertainty and the Optimal Supply Policy for an Exhaustible Resource,” in R.S. Pindyck (ed.) *Advances in the Economics of Energy & Resources*, vol. 2, pp. 119-147, J.A.I. Press, 1977.
- 10 “The Long-Run Movement of Resource Prices,” Plenary Session Paper, Fourth Published in E. Malinvaud (ed.) *Economic Growth & Resources: The Major Issues*, Macmillian, 1979.
- 11 “On a Relationship Between Economic & Thermodynamic Optima” (with R.S. Berry & P. Salomon), *Resources & Energy*, 1978, vol. 1, pp. 125-137.
- 12 “Energy Demand in the UK” (with M. Barrow). Study for the UK Department of Energy, 1978.
- 13 “Economics & Resources,” in J. A. Butlin (ed.) *Economic Analysis of Resource Depletion*, Longmans, 1979.
- 14 “Funding Research & Development” (with P.S. Dasgupta and A.K. Pand), Applied Mathematical Modeling, 1980.
- 15 “Intertemporal Allocation and Intergenerational Equity,” in Ershopfbare Ressourcen, *Schriften des Vereins fur Sozialpolitik*, Band 108, 1980.
- 16 “The Taxation of Exhaustible Resources” (with P.S. Dasgupta and J.E. Stiglitz) in G. M. Heal and G.A. Hughes (eds.) *Public Policy and the Tax System: Essays in Honour of J.E. Meade*, Longmans, 1980, pp. 150-172.
- 17 “Empirical Investigation of the Long Run Movement of Natural Resource Prices: A Preliminary Report” (with M. Barrow), *Economics Letters*, 7, 1981, pp. 95-103.
- 18 “An Econometric Evaluation of Long-Run Movement of Mineral Prices” (with M. Barrow), in V.K. Smith (ed.) *New Approaches to Modeling Resource Markets*, Johns Hopkins for Resources for the Future, 1981.
- 19 “The Use of Common Property Resources,” in *Restructuring the Economics of Natural Resources*, ed. by J. Krutilla & V.K. Smith for Resources for the Future, Johns Hopkins, 1981.
- 20 “Scarcity, Efficiency & Disequilibrium in Resource Markets,” *Scandinavian Journal of Economics*, 1981.
- 21 “Resource Prices and Resource Scarcity,” in *Proceedings of the Wisconsin Seminar on Natural Resource Policies in Economic Development*, University of Wisconsin, Madison.
- 22 “Non-conflicting Oil Pricing Policies in the Long Run” (with G. Chichilnisky & A. Sepahban), *OPEC Review*, 1982.
- 23 “Interaction between Economy & Climate: a Framework for Policy Design under Uncertainty,” presented at a conference organized by the National Climate Program and the N.S.F. and published in V.K. Smith and A.D. White (eds.) *Advances in Applied Micro-Economics*, J.A.I. Press, 1984.

- 24 “The Intertemporal Problem” in *Natural Resource Economics*, D.W. Bromley (ed.), Kluwar Nijhoff, 1986.
- 25 “Resources Naturalles, Commerce et Endettment” (with G. Chichilnisky & D. McLoed), in G. Gaudet & P. Lasserre (eds.) *Resources Naturelles & Theorie Economique*, Les Presses de l’Universite Laval.
- 26 “Depletion and Discounting: a Classical Issue in Resource Economics,” in R. McElvey (ed.) *Environmental and Natural Resource Mathematics*, Vol. 32 pp. 33-43 of Proceedings of Symposia in Applied Mathematics, American Mathematical Society, Providence, Rhode Island, 1985.
- 27 “Resources Trade & Debt: the Case of Mexico” (with G. Chichilnisky & D. McLoed), The World Bank, Global Analysis and Projects Division, Division Working Paper No. 1984-5, 1984.
- 28 “Energy Capital Substitution: a General Equilibrium Analysis” (with G. Chichilnisky), Collaborative Paper, IIASA, Laxenburg, Austria, 1983.
- 29 “The World Oil Market, Past & Future” (with G. Chichilnisky) *Columbia Journal of World Business*, Spring 1984.
- 30 “Economy and Climate: a Preliminary Framework for Microeconomic Analysis,” in R.E. Just & N. Bockstael (eds.), *Commodity and Resource Policies in Agricultural Systems*. Springer, Berlin, Heidelberg, New York, 1991, pp. 196-212.
- 31 “Optimal Resource Use” in J. Sweeney (ed.) *Handbook of Natural Resource Economics*, Vol. 3, Chapter 18, pp. 855-880, North Holland Publishing Co., 1993.
- 32 “Economics and Global Change.” Published by NASA/NSF/NOAA, 1991. One of panel of academics and governmental officials who wrote this interagency report.
- 33 “International Negotiations on Emission Control.” Discussion paper, Columbia Business School, 1991. *Economic Dynamics and Structural Change*, 1993, vol. 3, no. 2, 223-240.
- 34 “Risk Management and the Greenhouse Effect.” Presented at the First Nordic Conference of the Greenhouse Effect in Copenhagen, September, 1991.
- 35 “The Rain Drain” (with G. Chichilnisky), Hermes, Summer, 1992.
- 36 “Application of the Polluter Pays Principle in Developing Countries” in *Fair Principles for Sustainable Development*, edited by E. Dommen, UNCTAD, Geneva, 1992. Edward Elgar, 1993.
- 37 “Global Environmental Risks” (with G. Chichilnisky) *Journal of Economic Perspectives*, Fall 1993, Vol. 7, No. 4, 65-86.

- 38 “Sustainable Growth and the Green Golden Rule” (with A. Beltratti and G. Chichilnisky), paper presented at OECD conference on Sustainable Growth, Paris, 1993, in Ian Goldin and L. Alan Winters (eds.) *Economic Approaches to Sustainable Development*, OECD, Paris, 1994, pp. 147-166.
- 39 “Formation of International Environmental Agreements,” in C. Carraro (ed.) *The International Dimension of Environmental Policy*, Kluwer, 1994.
- 40 “Valuing the Long Run: Environment and Discounting.” Working paper, Columbia Business School, 1993.
- 41 “Who Should Abate Carbon Emissions? An International Perspective” (with G. Chichilnisky). *Economic Letters*, 1994, 44, 443-449.
- 42 “The Green Golden Rule” (with A. Beltratti and G. Chichilnisky. *Economic Letters*, 49, 1995, pp. 175-179.
- 44 “Strategic Behavior in Permit Markets” (with Y. Lin). In *Environmental Markets*, G. Chichilnisky and G.M. Heal (eds), Columbia University Press.
- 45 “Markets and Biodiversity,” paper presented at conference Biological Diversity: Exploring the Complexities, in *Protecting Biodiversity: Converging Strategies*, pp. 209-230, Duke University Press, 1998, edited by Lakshman Guruswamy.
- 46 “Interpretations of Sustainability,” presented at the Plenary Session of the Canadian Association of Social Sciences. Published in *Social Sciences and the Environment* (ed.) L. Quesnel, University of Ottawa Press, 1995, 119-143.
- 47 “The Environment and the Long-run: Exploring Alternative Optimality Criteria” (with Betratti and Chichilnisky), *Recherche Economique*, 1994, 48, 319-340.
- 48 “Uncertain Future Preferences and Conservation” (with Beltratti and Chichilnisky), in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 49 “Interpreting Sustainability,” Plenary Address, European Association of Environmental and Resource Economists, Lisbon, 1996, in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 50 “Markets for Tradable Carbon Dioxide Emission Quotas: Principles and Practice” (with Chichilnisky), a report to the OECD, published by them in 1994. In *Environmental Markets*, G. Chichilnisky and G.M. Heal (eds), Columbia University Press.
- 51 “The International Dimensions of Environmental Policy.” *Journal of International and Comparative Economics*, Vol. 4, 1995.

- 52 “International Dimensions of Environmental Policy.” *Agriculture, Trade and the Environment: Discovering and Measuring the Critical Linkages*, (eds.) M. Bredahl, N. Ballenger, J. Dunmore and T. Roe, Westview Press, 1996.
- 53 “Building Linkages between Climate, Impacts and Economics: a New Approach to Integrated Assessment,” (with Chichilnisky, Gornitz, Rind and Rosenzweig).
- 54 “The Economic Value of Climate Forecasts: a Case Study of the Impact of El Nino-Southern Oscillator on the Economy of Zimbabwe,” (with Y. Lin). Forthcoming in *Climatic Change*.
- 55 “Global Environmental Risks” (with G. Chichilnisky), in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 57 “Sustainable Use of Renewable Resources,” (with Beltratti and Chichilnisky) in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwar Academic Publishers, for Fondazione ENI Enrico Mattei, 1998.
- 58 “Discounting and Climate Change”, *Climatic Change*, December, 1997.
- 59 “Economic Returns from the Biosphere” (with G. Chichilnisky). Working paper, Columbia Business School, 1997. *Nature*. vol 391, February 1998.
60. “Economy and Environment”, Commencement Address, UC Berkeley, May 1997.
61. “Emission Constraints, Emission Permits and Marginal Abatement Costs”. In *Environmental Markets*, Columbia University Press, 1998, edited by Chichilnisky and Heal. Also published in *Topics in Environmental Economics*, edited by M. Bowman et al, Kluwer, 1999.
62. “Markets and Sustainability”. *The Science of the Total Environment*, 240 (1999) 75-89, special issue devoted to proceedings of a conference on *Managing Biodiversity*, organized by Resources for the Future and the Electric Power Research Institute.
63. “Sustainability and Markets”, in R. Revesz, P. Sands and R. Stewart (eds) *Environmental Law, the Economy and Sustainable Development*. Cambridge University Press, 1999.
64. “National Income and the Environment” (with Bengt Kristrom). Plenary lecture, International Economic Association World Congress, Buenos Aires, 1999.
65. “New Strategies for the Provision of Global Public Goods: Learning from international environmental challenges.” In *Global Public Goods*, published by Cambridge University Press in 1999 for the United Nations Development Program, edited by I Kaul and M. Stern.
66. “The Market and the Environment.” In *Managing Human-Dominated Ecosystems*, Missouri Botanical Garden Press, edited by Peter Raven, 2001.
67. “Biosphere, Markets and Government”. To be published in the proceedings of a conference on Market-Augmenting Government, sponsored by USAID.

68. “Valuing Ecosystem Services.” *Ecosystems*, 2000, 3: 24-30.
69. “Biodiversity as a Commodity.” *The Encyclopedia of Biodiversity*, eds S. Levin, J. Lubchenco, D. Tilman and G. Daily, Academic Press, 2000.
70. “Environmental Policy as Risk Management”. In the *Economics of International Environmental Problems*, edited by Horst Siebert, Mohr Siebeck for Institut für Weltwirtschaft an der Universität Kiel.
71. “National Income”, entry (with Bengt Kristrom) in the *Handbook of Environmental Economics*, Maler and Vincent eds, to be published in 2004 by Elsevier.
72. “Intertemporal Welfare Economics and the Environment”, entry in the *Handbook of Environmental Economics*, Maler and Vincent eds, 2005, Elsevier.
73. “Valuing our Future: Cost-Benefit Analysis and Sustainability” in *Incentives Organization and Public Economics, Papers in Honour of Sir James Mirrlees*, Edited by Peter Hammond and Gareth Myles, Cambridge University Press, 2000.
74. “Environmental problems with a path to profit” *Financial Times*, October 30, 2000.
75. “The Economics of Sustainability”, in *Sustainability and Growth*, edited by Carlo Cararro, Cambridge University Press.
76. “Biodiversity in the Marketplace.” *World Economics*, Vol1 No. 4 October-December 2000.
77. “Environmental analysis: are we organized to confront deep uncertainty?” (with Kinzig, Carpenter, Dove, Levin, Lubchenco, Schneider and Starrett). *Ambio* 2003.
78. “Protecting Natural Capital Through Ecosystem Service Districts” Geoffrey Heal, Gretchen C. Daily, Paul R. Ehrlich, James Salzman, Carol Boggs, Jessica Hellmann, Jennifer Hughes, Claire Kremen, Taylor Ricketts. *Stanford Law Journal* 2002.
79. “Socially responsible investment,” *Financial Times*, 2001.
80. “Uncertainty and Climate Change” (with Bengt Kristrom) In *Environmental and Resource Economics* 2003
81. “Optimality or sustainability” In Festschrift for Joseph Stiglitz, 2003, MIT Press
82. “Bundling Public and Private Goods”
83. “National Income in Dynamics Economies” (with Bengt Kristrom) Forthcoming in *Handbook of Environmental Economics*, editors Maler and Vincent, published by Elsevier.
84. “Are We Consuming Too Much?” (with Arrow Dasgupta Goulder et. al) in *Journal of Economic Perspectives* summer 2004.

85. “Genetic Diversity and interdependent crop choice in agriculture” (with Arrow Dasgupta Goulder Daily Ehrlich et. al) in *Resource and Energy Economics* 2003
86. “Bundling Biodiversity,” *Journal of the European Economic Association*, Vol 1, No 2/3, 553-560, 2003.
87. “Globalization and Biodiversity” in the *Global Governance: An Agenda for the World Economy*, Horst Siebert (editor), Springer Verlag.
88. “Coping with uncertainty”, *Ambio*, 2005. (with K-G Maler, A. Kinzig, K. Arrow, P. Dasgupta et al.)
89. “The economics of biodiversity”, in *Resource and Energy Economics* 2003.
90. “Environmental risks and financial institutions” *Economic Notes*, forthcoming.
91. “Arbitrage options and endangered species” to be published in *The Endangered Species Act at Thirty: Conserving Biodiversity in Human-Dominated landscapes*, Island Press 2006, Mike Scott and Frank Davis (eds).
92. “Agriculture and ecosystem services,” (with A Small) in *Handbook of Agricultural Economics*, Elsevier, 2003, editor Gordon Rausser
93. “Corporate social responsibility – economic and financial perspectives” *Geneva Papers* 2005 30 387-409.
94. “Incentives to Reduce Tropical Deforestation” (with Kevin Conrad) *Journal of Forest Economics* vol 11 4 2006
95. “Valuing Ecosystem Services” *The Economists’ Voice* January 2006 (with Ed Barbier)
96. “Exhaustible Resources” *The New Palgrave Dictionary of Economics*
97. “Accounting and the Resource Curse” in *Avoiding the Resource Curse* Macartan Humphreys, Jeffrey Sachs and Joe Stiglitz (Eds), Columbia University Press, 2007.
98. “A celebration of environmental and resource economics,” *Review of Environmental Economics and Policy*, Vol 1 Number 1 Winter 2007 pp 7-25.
99. “Consumption, Investment and Future Well-Being: Reply to Daly et al.” *Conservation Biology*, Vol. 21 No.5 1363-1365. (with Arrow, Daily, Dasgupta, Ehrlich, Goulder, Levin, Maler, Schneider, Starrett and Walker.)
100. “Distribution, Sustainability and Environmental Policy” Chapter 10 in *Handbook of Sustainable Development*, Giles Atkinson, Simon Dietz and Eric Neumayer (Eds), Edward Elgar, 2007, (with Bengt Kristrom)
101. “Corporate Social Responsibility: An Economic and Social Perspective”, *The Geneva Papers*, 2005, 30,387-409

102. "Climate Economics: a Meta-Review and Some Suggestions for Further Research," *Review of Environmental Economics and Policy*, 2008, pp 1-19
103. "What do we know about the economics of climate change?" *Climatic Change*, 2009.
104. "Sustainable Fisheries", *Nature*, 23 Oct 2008, (with Wolfram Schlenker)
105. "National Income in a Dynamic Economy", *Economics Letters*, 98 2008 (with Bengt Kristrom, Umea Sweden)
106. "Corporate Environmentalism" forthcoming in *Environmental Economics and Policy Studies*
107. "Environmental Assets and Liabilities of the Federal Government" (with Howard Kunreuther, Wharton in *Assets and Liabilities of the Federal Government*, editor Deborah Lucas, NBER 2008.
108. "The Costs of Inaction with Respect to Biodiversity Loss". Presented at an OECD Ministerial meeting on the costs of environmental inaction, published in *Global Biodiversity: Conservation and Management Issues*, ICFAI Press.
109. "Doing Well by Being Green". Chapter 8 of *Is Growth Sustainable*, International Economic Association, (Heal, editor), Palgrave Press, 2009.
110. "Environmental Politics" in Kleindorfer and Michel-Kerjan (eds) *The Irrational Economist*, Wharton Press. 2009
111. "Investment and Emissions Control under Technology and Pollution Externalities," *Resource and Energy Economics* (with Nori Tarui of Hawaii) 2009
112. "The Prospects for Renewable Energy in the US." Published in *Review of Environmental Economics and Policy* 2009
113. "Social Reinforcement: Cascades, Entrapment and Tipping." *American Economic Journals: Micro* 2010 (with Howard Kunreuther, Wharton)
114. "Tipping Climate Negotiations" (with Howard Kunreuther) In *Thinking about the Climate: Essays in Honor of Tom Schelling*, Oxford University Press
115. "Scientific Ambiguity and Climate Policy" (with Simon Dietz and Antony Millner), *Environmental and Resource Economics*, May 2013, vol 55, issue 1, pp 21-46
116. "What have we learned about development economics?" *Proceedings of ABCDE 2010* (Annual World Bank Conference on Development Economics)
117. "Facilitating Pareto-Optimal Subsidies by Co-ordination in Stochastic and Deterministic Settings" (With Min Gong, Howard Kunreuther, Elke Weber and David Krantz). Published in .

118. "The Value of Sea Lions" with Min Gong. Accepted subject to revision, *Environmental and Resource Economics*
119. "From Growth to Green Growth – a Framework" with Stephane Hallegate, Marianne Fay and David Treuger, World Bank Working Paper. Submitted to Journal of Environmental Economics and Management.
120. "Perspectives on Sustainability" *Review of Environmental Economics and Policy*, 2011, volume 6, issue 1, winter 2012, pp. 147–163
121. "Uncertainty and Decision in Climate Change Economics," (with Antony Millner), , *Review of Environmental Economics and Policy*, 2014.
122. "Risk Management and Climate Change," (with Howard Kunreuther, Myles Allen, Ottmar Edenhofer, Christopher Field and Gary Yohe). *Nature Climate Change*, March 2013, 3, pp 447-450.
123. "Discounting under Disagreement" (with Antony Miller), June 2013, submitted *American Economic Review*.
124. "Time-Varying Discount Rates and Renegotiation-Proof Plans" (with Antony Millner)
125. "Determining benefits and costs for future generations" (with Kenneth Arrow et al) *Science Magazine*, **341** (6144): 349-350
126. "Agreeing to Disagree on Climate Policy" (with Antony Millner, LSE) *Proceedings of the National Academy of Sciences* www.pnas.org/cgi/doi/10.1073/pnas.1315987111
127. "Why Do People Care About Sea Lions? A Fishing Game to Study the Value of Endangered Species" (with Min Gong, Psychology, Columbia) *Environmental and Resource Economics* (2014) 59:503–523
128. "The Role of Subsidies in Coordination Games with Interconnected Risks" (with Min Gong, David Krantz (Columbia Psychology), Howard Kunreuther (Wharton) and Elke Weber) *Journal of Behavioral Decision-Making*
129. "Bottom-Up Climate Policies" (with Howard Kunreuther, Wharton), forthcoming in *Climatic Change*
130. "Feeling the Heat: Temperature, Productivity and the Wealth of Nations" (with Jisung Park).
131. "Should Climate Policies Account for Ambiguity?" (with Antony Millner) forthcoming in Robert Litterman (ed) "The Economics of Climate Risk," Wiley, 2015.
132. Contribution to "Risky Business," a report on the impact of climate change on the US economy sponsored by Messrs Bloomberg, Paulson and Steyer, already published on the web and forthcoming via Columbia Press in 2015.
133. "Resolving Intertemporal Conflicts: Economics vs Politics" (with Antony Millner LSE). Submitted to *American Economic Review*.
134. "The Economics of Marine Protected Areas" (with James Rising). To be submitted to *Science*.

135. K.J. Arrow, M. Cropper, C. Gollier, B. Groom, G.M. Heal, R.G. Newell, W.D. Nordhaus, R.S. Pindyck, W.A. Pizer, P.R. Portney, T. Sterner, R.S.J. Tol, and M.L. Weitzman. "Should Governments Use a Declining Discount Rate in Project Analysis?" **Review of Environmental Economics and Policy**, 8(2), 145-163, July 2014.
136. Scientific Ambiguity and Climate Policy (with Antony Millner and Simon Dietz) *Environmental and Resource Economics* (2013) 55:21–46. Awarded prize for the best paper of the year.
137. An alternative framework for negotiating climate policies (with Howard Kunreuther Wharton) *Nature Climate Change* 2015
138. Temperature stress and the direct impact of climate change: a review of the emerging literature (with Jisung Park) *Review of Environmental Economics and Policy*.
139. The economics of the climate, *Journal of Economic Literature*, 2016
140. "Pricing climate risk" in "Economic risks of climate change," sponsored by Michael Bloomberg, Henry Paulson and Thomas Steyer and edited by Houser, Hsiang, Kopp and Larsen, Columbia University Press, 2015.
141. "What we do not know about the economics of climate change." Submitted to Science, revise and resubmit. (With Charles Kolstad and others.)
142. Host-MNC Relations in Resource-Rich Countries, accepted for publication in Handbook on the Economics of Climate Change, Editors Chichilnisky and Rezai, Edward Elgar, 2019.
143. Collective intertemporal choice: time consistency vs time invariance (with Antony Millner)
144. Redressing the balance: responsibility and entitlement in public goods games (with Antony Millner)
145. Global benefits of marine protected areas (with James Rising)
146. Feeling the heat: temperature, physiology and the wealth of nations (with Jisung Park). Submitted to the Journal of Political Economy
147. Understanding the impact of climate change on our effectiveness (with Jisung Park, Harvard) The Daily Climate August 18th
148. The imperative of forest conservation (with Kevin Conrad, Paul Chung and Federica Bietta) The Daily Climate November 19th.
149. How lower oil prices impact the competitiveness of oil with renewable fuels (with Karoline Hallmeyer) at http://energypolicy.columbia.edu/sites/default/files/energy/How%20Lower%20Oil%20Prices%20Impact%20the%20Competitiveness%20of%20Oil%20with%20Renewable%20Fuels_October%202015.pdf
150. Perspectives on Paris, at http://energypolicy.columbia.edu/sites/default/files/energy/Heal_Perspectives%20on%20Paris.pdf

151. Big boys' games, big boys' rules – every producer for itself. Distributed by CLSA/CITIC
152. Time consistency and time invariance in collective intertemporal choice (with Antony Millner LSE) *Journal of Economic Theory* 176 (2018) 158-169
153. Discounting by committee (with Antony Millner) *Journal of Public Economics* 167 (2018) 91-104
154. Uncertainty and Ambiguity in Environmental Economics: Conceptual Issues (with Antony Millner), chapter 10 of Handbooks in Economics, Vol. 4, Handbook of Environmental Economics, editors P. Dasgupta, V.K. Smith and S.K. Pattanayak.
155. Beyond GDP: Measuring what counts for economic and social performance. Published by OECD, edited by Stiglitz, Fitoussi and Durand. I was one of a dozen authors of this report.
<http://www.oecd.org/publications/beyond-gdp-9789264307292-en.htm>
156. For good measure: advancing research on well-being metrics beyond GDP. Published by OECD, edited by Stiglitz, Fitoussi and Durand. I was one of a dozen authors of this report.
<http://www.oecd.org/publications/for-good-measure-9789264307278-en.htm>
157. Coase, Hotelling and Pigou: Carbon Taxes vs Cap and Trade in Controlling Emissions from Fossil Fuels (with Wolfram Schlenker) NBER Working Paper 13579
158. Choosing the Future: Markets, Ethics and Realpolitik in Social Discounting (with Antony Millner) (written for the *Journal of Economic Literature*)
159. Rising Oceans: Economics and Science (with Marco Tedesco, Earth and Environmental Sciences, Columbia)
160. Price Uncertainty and Price-Contingent Securities. NBER Working Paper 23723
- 161.

On Economic Growth:

- 1 “Optimal Growth with Intertemporally Dependent Preferences” (with H. Ryder), *Review of Economic Studies*, 1973, V. 40(121), 1-32.
- 2 “A Note on Complementarity Over Time” (with H. Ryder), *Review of Economic Studies*, 1976, V. 43(133), 183-4.

On Economic Planning:

- 1 “Planning without Prices,” *Review of Economic Studies*, 1969. Reprinted in M.J. Farrell (ed.) *Readings from the Review of Economic Studies in Welfare Economics*, Macmillan, 1973.

- 2 “Planning, Prices & Increasing Returns,” *Review of Economic Studies*, 1971.
- 3 “Decentralization in Economics,” presented at the 1972 meeting of the Joint Automatic Control Conference and published in the proceedings.
- 4 “Plannung” in *Handwörterbuch der Mathematischen Wirtschaftswissenschaften*, Band Ein, Wirtschaftstheorie, (ed.) R. Selten, Gabler, 1979.
- 5 “Recent Developments in the Theory of Economic Planning” in G. Castellani & P. Mazzoleni (eds.) *Mathematical Programming & its Applications*, Angeli, Milan, 1981.
- 6 “Planning,” Chapter 29, Vol. 3, in *Handbook of Mathematical Economics*, K. Arrow & M.D. Intrilligator (eds.), North Holland Publishing Co., 1986.
- 7 “Some Analytical Issues in Long-Run Planning,” *International Journal of Development Planning*, 1987. Also in I. Adelman & J.E. Taylor (eds.) *The Design of Alternative Development Strategies*, Jan Tinbergen Institute of Development Planning, Rohtak, 1986.

On Uncertainty and Incomplete Markets:

- 1 “Guarantees and Risk Sharing” *Review of Economic Studies*, 1977.
- 2 “Notes on the Economic Consequences of Uncertain Product Quality,” in G. Schwodiauer (ed.) *Equilibrium and Disequilibrium in Economic Theory*, Proceedings of a Conference Organized by the Institute for Advanced Studies, Vienna, 1974. Riedel, 1978.
- 3 “Do Bad Products Drive Out Good?” *Quarterly Journal of Economics*, 1976.
- 4 “Imperfect Information and the Retail Trade,” Discussion Paper, Office of Fair Trading, 1976.
- 5 “Advertising as a Source of Information,” Discussion Paper, Office of Fair Trading, 1976.
- 6 “Price Uncertainty and Derivative Securities in a General Equilibrium Model” (with J. Dutta & G. Chichilnisky). Discussion Paper, Columbia Business School, 1991.
- 7 “Catastrophe Futures: Financial Markets for Unknown Risks” (with G. Chichilnisky). Discussion Paper, Columbia Business School, 1991. Published in Chichilnisky, Heal and Vercelli (eds.) *Sustainability: Dynamics and Uncertainty*, Kluwer, 1997.
- 8 “Believing in Multiple Equilibria” (with G. Chichilnisky, P. Steufert and J. Swinkels). Stanford Discussion Paper, 1991.
- 9 “Price Uncertainty and Incomplete Markets” (with G. Chichilnisky and F.H. Hahn). Working Paper, Columbia Business School, 1992.
- 10 “Complexity and Missing Markets” (with G. Chichilnisky), Working Paper, Columbia Business School, 1993.

- 11 “Option Values and Endogenous Uncertainty in MBOs, ESOPs and Asset-Backed Loans” (with G. Chichilnisky and Tsomocos), Working Paper, Columbia Business School, 1993. *Economics Letters*, 1995, 48, 379-388.
- 12 “Derivatives and the Efficient Allocation of Price Risks in a General Equilibrium World,” Working Paper, Columbia Business School, 1996. Forthcoming in *Endogenous Uncertainty*, Springer Verlag, Studies in Economic theory, 1998.
- 13 “Managing Unknown Risks” (with G. Chichilnisky), *Journal of Portfolio Management*, Spring, 1998.
- 19 “Interdependent Security: the case of identical agents” (with Howard Kunreuther) in *Journal of Risk and Uncertainty* 2003.
- 20 “You only die once: Interdependent Security in an Uncertain World” (with Kunreuther) - in H.W. Richardson, P. Gordon and J.E. Moore II, eds., *The Economic Impacts of Terrorist Attacks*. Cheltenham, UK: Edward Elgar, 2005
- 21 “Interdependencies within an organization” (with Howard Kunreuther) Chapter 8 of *Organizational Encounters with Risk* Cambridge, eds Bridget Hutter and Michael Power.
- 22 “The Vaccination Game” (with Howard Kunreuther) 2004
- 23 Interdependence and National Security, *Brookings Policy Brief*, 2002 (with Howard Kunreuther and Peter Orzag)
- 24 “IDS models of airline security” *Journal of Conflict Resolution* (with Kunreuther) vol 49 2 201-217
- 25 “Interdependent Security in Interconnected Networks” (with Howard Kunreuther, Paul Kleindorfer and Michael Kearns) in *Seeds of Disaster*, eds Erwan Michel-Kerjan and Paul Auerswag, Cambridge.
- 26 “You Only Die Once: Interdependent Security in an Uncertain World” (with Howard Kunreuther) Chapter 3 of *The Economic Impacts of Terrorist Attacks*, Harry Richardson, Peter Gordon and James Moore (Eds), Edward Elgar, 2007.
- 27 “Social Reinforcement: Cascades, Entrapment and Tipping” with Kunreuther. *American Economic Journals – Micro* 2009.

On Increasing Returns and Public Sector Economics:

- 1 “The Existence of Equilibrium in an Economy with Increasing Returns in Production,” (with D.J. Brown), Cowles Foundation Discussion Paper No. 425, 1976.
- 2 “Equity, Efficiency and Increasing Returns” (with D.J. Brown), *Review of Economic Studies*, XLVI (4) No. 145, 571-585, October 1979.

- 3 “Spatial Structure in Retail Trade: a Study in Product Difference with Increasing Returns,” *Bell Journal*, 1980.
- 4 “Two-Part Tariffs and Marginal Cost Pricing with Increasing Returns in a General Equilibrium Model” (with D.J. Brown), *Journal of Public Economics*, 1980.
- 5 “Rational Rationing with Increasing Returns,” *Economic Letters*, 1981.
- 6 “Monetary Policies and Increasing Returns” (with G. Chichilnisky), Columbia University Economics Working Paper, 1982.
- 7 “Equivalence of Saddle points and Optima for Non-Concave Programming Problems,” *Advances in Applied Mathematics*, 1985, 398-415.
- 8 “Marginal vs. Average Cost Pricing in the Presence of a Public Monopoly” (with D.J. Brown), *American Economic Review*, Papers and Proceedings, 1983.
- 9 “The Optimality of Regulated Prices” (with D.J. Brown), in C.D. Aliprantis, O. Burkinshaw and N.J. Rothman (eds.) *Advances in Equilibrium Theory*, Springer Verlag, Lecture Notes in Economic and Mathematical Systems, 1985.
- 10 “Ramsey Pricing in Telecommunications Markets with Free Entry” (with D.J. Brown) in M.A. Crew (ed.) *Regulating Utilities and Era of Deregulation*, Macmillian, 1987.
- 11 “Macrodynamics and Returns to Scale,” *Economic Journal*, 1984.
- 12 “Stable Disequilibrium Prices,” Discussion Paper, Columbia Business School, 1983. *Economic Letters*, 1993, 40, 423-428.
- 13 “Chaotic Price Dynamics, Increasing Returns and the Phillips Curve” (with G. Chichilnisky and Y. Lin), Discussion Paper, Columbia Business School, 1983. Revised 1992. *Journal of Economic Behavior and Organization*, 1995, Vol. 27, 279-291.
- 14 “The Economics of Networks” Discussion Paper, Columbia Business School, 1990. Forthcoming in G. Chichilnisky (ed.) *The Structure of Economic Theory: Essays in Honour of Kenneth Arrow*.
- 15 “Robustly Efficient Equilibria in Non-Convex Economies” (with G. Chichilnisky). Discussion Paper, Columbia Business School, 1991.

On Social Choice, Incentives & Preference Aggregation:

- 1 “Necessary and Sufficient Conditions for the Resolution of the Social Choice Paradox” (with G. Chichilnisky), *Journal of Economic Theory*, 1983, V. 12(1), 33-62.
- 2 “Community Preference and Social Choice” (with G. Chichilnisky), *Journal of Mathematical Economics*, 1983.

- 3 “Patterns of Power: Bargaining and Incentives in Two-Person Games” (with G. Chichilnisky), *Journal of Public Economics*, 1984.
- 4 “Contractibility and Public Decision-Making,” in P. Pattaniak & M. Salles (eds.) *Social Choice and Welfare*, North Holland Publishing Co., 1983.
- 5 “Social Choice with Infinite Populations: Construction of a Rule and Impossibility Results” (with G. Chichilnisky), Discussion Paper, Columbia University Department of Economics, 1979. *Social Choice and Welfare*, 14, 303-318, 1997.
- 6 “Incentive Compatibility & Local Simplicity” (with G. Chichilnisky), *Social Choice and Welfare*, 1997.
- 7 “The Geometry of Implementation: a Necessary & Sufficient Condition for Straightforward Games” (with G. Chichilnisky), *Social Choice and Welfare*, 14, pp. 259-294, 1997.
- 8 “Social Choice and Resources Allocation: a Topological Perspective,” editor’s introduction to the volume *Topological Social Choice*, a special issue of *Social Choice and Welfare*, 14, pp. 147-160, 1997.

On International Economics:

- 1 “A Geometric Explanation of the Transfer Paradox” (with J. Geanakoplos), *Journal of Development Economics*, 1983.
- 2 “To Give or To Destroy: a Note on Leontieff, Gale and Aumann-Peleg” (with G. Chichilnisky), Working Paper, Columbia Business School, 1983.
- 3 “The Management of Trade with Increasing Returns” (with G. Chichilnisky), Working Paper, Columbia Business School, 1983.
- 4 “Trade & Development in the 1980's” (with G. Chichilnisky), in A. Bapna (ed.) *One World One Future: New International Strategies for Development*, Praeger, 1986.
- 5 “Gains From Trade, Stability & Profits: a Comment on Chichilnisky’s Terms of Trade & Domestic Distribution” (with D. McLoed), *Journal of Development Economics*, 1984.
- 6 “Free Trade: The End of an Era?” (with G. Chichilnisky), *Columbia Journal of World Business*, 1985.

On General Equilibrium & Welfare Economics:

- 1 “The Welfare Economics of Competitive Equilibrium with Endogenous Endowments” (with G. Chichilnisky), Working Paper, Department of Economics, Columbia University, 1979.
- 2 “On a General Existence Theorem for Marginal Cost Pricing Equilibria” (with D.J. Brown, M. Ali Khan and R. Vohra), *Journal of Economic Theory*, 1986.

- 3 “Competitive Equilibrium in Sobolev Spaces Without Bounds on Short Sales” (with G. Chichilnisky) Working Paper, Columbia Business School, 1983. *Journal of Economic Theory*, 1993, Vol. 59, No. 2, April, 364-384.
- 4 “On the Existence and the Structure of the Pseudo-Equilibrium Manifold” (with G. Chichilnisky). *Journal of Mathematical Economics*, 26, pp. 171-186, 1996.
- 5 “Arbitrage and Equilibrium in Economics with Infinitely Many Securities and Commodities” (with G. Chichilnisky). Columbia Business School Discussion Paper, 1992. *Economic Theory*
- 6 “Externalities, Returns to Scale and Theory of the Firm,” (with G. Chichilnisky and U. Pagano). Discussion Paper, University of Siena and Columbia Business School, 1992.
- 7 “Welfare Gains to Traders from Increasing Market Size,” Discussion Paper, Columbia Business School, December 1991. *Economic Letters*, 1993.
- 8 “Alternative Managerial Objectives” (with A. Silberston), *Oxford Economic Papers*, 1972.
- 9 “Securities Markets with Increasing Numbers of Traders,” *Economic Letters*, 1992, 39, 461-465.

On the Securities Industry:

- 1 “Margin Levels as a Regulatory Tool,” Center for the Study of Futures Markets, Columbia Business School, 1984.
- 2 “Linking Depositories, Fund Managers & Brokers,” in *Proceedings of a Symposium on International Securities Lending*, Institute for International Research, New York, 1988.
- 3 “Systems Support for International Securities Lending,” in *Proceedings of a Symposium on International Securities Lending*, Institute for International Research, New York, 1989.
- 4 “Global Custody Towards 2000” (with G. Chichilnisky), *Global Custodian*, September 1990.
- 5 “Inefficient Theory,” *Barron’s Financial Weekly*, June 24, 1996.

Others:

Various book reviews in *Economic Journal*, *Journal of Economic Literature*, *Journal of Public Economics*, and others.

Grants Received:

Principle investigator on numerous grants from US National Science Foundation, UK Social Science Research Council, Electric Power Research Institute, Department of Energy, Sloan Foundation, NOAA and others.