

R I S K A N D S U S T A I N - A B L E M A N A G E M E N T G R O U P

*Schools of Economics and Political Science, University
of Queensland*

ANNUAL REPORT 2007



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Foreword

The inter-related problems of climate change and the Murray–Darling Basin have come to the forefront of Australian public policy debate. The Stern and Garnaut Reviews of the economics climate change have stimulated extensive public debate, and pointed to large gaps in our knowledge and understanding of the issues. The impact of severe drought and record low inflows to the Murray–Darling Basin, caused in part by climate change, has raised new challenges for water policy. The Risk and Sustainable Management Group has sought to respond to these issues both by contributing to the immediate debate over water policy and by the development of improved models and theoretical frameworks within which a sustainable long-term response to climate change may be formulated.

Acknowledgements

Our central achievements in 2007 have been the successful completion of the Australian Research Council Federation Fellowship project under which the Group was funded, and the award of a second Federation Fellowship, which commenced on 31 December 2007. Primary credit for these achievements must go to the enthusiasm and energy of the members of the team.

The University of Queensland has provided a very supportive environment for research. The assistance of the Schools of Economics and of Political Science and International Studies, the Faculties of Business, Economics and Law and of Social and Behavioral Sciences, the Office of Research and Postgraduate Studies and the Vice-Chancellor has been particularly valuable.

Numerous private and government bodies engaged in research have provided helpful assistance. Particular thanks go the Murray–Darling Basin Commission for provision of data, advice and permission to use images in this Report, and to the Australian Bureau of Agricultural and Resource Economics for its encouragement in the development of collaborative research programs.

Above all, the Group thanks the Australian Research Council and the Australian government for the generous financial support given to the research reported here.

Highlights of 2007

A new focus on climate change

It has become increasingly evident that the Murray–Darling Basin is experiencing climatic changes leading to lower average inflows and more severe droughts, at least relative to the decades from 1950 to 1990. It seems likely that at least part of this change is the result of broader global climate change resulting from human activities such as the burning of fossil fuels. In addition to the Murray–Darling Basin, a range of iconic natural environmental assets in Australia are threatened by climate change, including the Great Barrier Reef and the Australian Alps.

For this reason, the Group has focused its research on mitigation of, and adaptation to, climate change, particularly in the Murray–Darling Basin. A central theme of our work is that mitigation and adaptation are not, as is often suggested, competing alternative responses. Without mitigation efforts to stabilise atmospheric levels of greenhouse gases, climate change will overwhelm any possible adaptation. And since significant climate change is inevitable even with robust mitigation, adaptation is both necessary and unavoidable.

Carbon neutrality and emissions trading: walking the walk

In 2007, the Group adopted and implemented a carbon neutrality policy, described in detail at <http://www.uq.edu.au/rsmg/carbon-neutrality-policy-rsmg>. The aims of the policy are:

- to reduce activities that generate emissions, and offset unavoidable emissions, thereby ensuring that RSMG makes a zero net contribution to emissions of greenhouse gases, so that the Group's activities are carbon-neutral;
- to identify efficiency improvements and savings sufficient to finance all offset costs, so that the Group's carbon-neutrality policy is budget-neutral (or budget-positive); and
- to provide experience and information that will assist the Group's research into climate change and related issues.

Awards

In May 2007, the work of the Group was recognised by the award of a second Australian Research Council Federation Fellowship to Professor John Quiggin, with funding to support a further five years of research. The Fellowship commenced on 31 December 2007. In addition, the Australian Research Council awarded funding for a Discovery Project, DP0877836 on State-contingent analysis of productivity, efficiency and innovation, to commence on 1 January 2008.

The Risk and Sustainable Management Group

Establishment

The Risk and Sustainable Management Group (RSMG) was formally established in May 2004, as a joint initiative of the School of Economics and the School of Political Science and International Studies at the University of Queensland. Funding has been provided by the Australian Research Council and the University of Queensland.

Work towards the establishment of the Group began in August 2003, when Professor John Quiggin took up an Australian Research Council Federation Fellowship to work on the project 'Sustainable reform of the Murray–Darling system: property rights, uncertainty and institutions'.

In 2007, Professor Quiggin was awarded a second Federation Fellowship for the project 'Climate change: adaptation and resilience in the face of uncertainty'. The Fellowship commenced on 31 December 2007, and will run until the end of 2012.

Aims

The central aim of the Risk and Sustainable Management Group is to use recent developments in the analysis of property rights and the theory of choice and production under uncertainty to provide a rigorous basis for the use of the precautionary principle in the management of complex economic–ecological systems. These developments will be applied to the design, modelling and evaluation of policies designed to promote ecologically, economically, and socially sustainable reform of the Murray–Darling system.

More generally, the aim of the Group is to show how the latest advances in economic theory can help to illuminate the major issues in the Australian public debate, from the role of government and the market to the assessment of standards of living, and to bridge the gap between economics and other social sciences.

Staff

John Quiggin: Federation Fellow



John Quiggin is a Federation Fellow in Economics and Political Science at the University of Queensland. Professor Quiggin is prominent both as a research economist and as a commentator on Australian economic policy. Among over 1000 publications, he has published five books and more than 300 journal articles and book chapters in fields including environmental economics, risk analysis, production economics, and the theory of economic growth. He has also written on policy topics including unemployment policy, microeconomic reform, privatisation, competitive tendering and the management of the Murray–Darling Basin..

David Adamson: Research Officer



David Adamson takes primary responsibility for the coding and maintenance of the Excel version of the Murray–Darling Model. His areas of expertise include: cost–benefit analysis of research and development programs; impact assessment of agricultural pest management issues; quarantine risk analysis; and MS Excel model development.

Giovanni B. (Nanni) Concu: Post Doctoral Research Fellow



Nanni Concu began work with the Group in October 2005. He also holds the position of External Researcher with the Università' di Sassari (Italy). Nanni completed his doctorate in January 2005 at the University of Western Australia. He is now undertaking a valuation study of Queensland's Vegetation Management Act 2004. He is also developing a GIS platform to integrate biophysical and economic data to map the market and non-market values of vegetation in the Queensland section of Murray–Darling Basin.



Mark Neal: Post Doctoral Research Fellow

Mark Neal began work with the Group in October 2005. In his PhD research at the University of Sydney, he examined the economics of New Zealand dairy production through the optimisation of a whole-farm model. Advanced techniques including evolutionary algorithms and distributed computing were used in the optimisation approach. Mark left the Group in 2007, to return to dairy farming.



Liam Wagner: Post Doctoral Research Fellow

Liam Wagner joined the Group as a Postdoctoral Research Fellow in September 2007. Dr Wagner was awarded his PhD in mathematics from the University of Queensland in May 2008. He has previously worked as a trader/analyst in the energy industry, providing advice on risk management and emissions trading, while also trading for an Open Cycle Gas Turbine power station. His current research interests include: maintenance of the GAMS version of the Murray–Darling Basin model; analysis of the National Emissions Trading Scheme; and modelling the impact of climate change on the Snowy Hydro Scheme.



Peggy Schrobback: Research Officer

Peggy Schrobback joined the team in November 2007. From her prior work in the development sector, she brings extensive experience in agriculture and resource management. Her main focus in our team is on modelling the impact of climate change on biodiversity and farm production systems using different bio-economic valuation techniques. She is also involved in a project on the simulation of climate change scenarios for aquaculture production systems.

Nancy Wallace: Research Assistant

Nancy Wallace provides editorial and bibliographic services, document management, research administration and reporting.

Research outcomes

To meet its objectives, the work of the Group has been divided into four programs:

- Murray–Darling Basin Program
- Risk and Uncertainty Program
- Australian Public Policy Program
- Climate Change Program

Each program encompasses a number of research projects.

Murray–Darling Basin Program

Objectives

The aim of this program is to apply new developments in economic theory to the design, modelling and evaluation of policies designed to promote ecologically, economically, and socially sustainable reform of the Murray–Darling Basin.

Project: Murray–Darling Basin

The Group's simulation model of land and water allocation in the Murray–Darling Basin has been the primary focus of our research. An article describing the model was published in the *Australian Journal of Agricultural and Resource Economics* in 2007. Another article, on indigenous cultural heritage values, was published in *Ecological Economics*.

Applications of the model to salinity mitigation, climate change, and the return of water to the Snowy River were undertaken in 2007 for presentation at the annual conference of the Australian Agricultural Economics Society in February 2008.

Project: Institutions and Property Rights

In the policy component of the project, the main focus has been on the sustainability of water management. A journal article and a major report were published in 2007, along with a number of newspaper articles, conference papers and presentations.

Risk and Uncertainty Program

Objectives

The aim of this project is to develop fundamentally new approaches to the theory of risk and uncertainty and its role in the design and management of complex projects and policy initiatives. The results will be applied to the issues of sustainable management of the Murray–Darling Basin and to analyses of Australian public policy, as described under those programs.

Project: Unforeseen Contingencies

The main objectives of theoretical research in the project were to develop models capable of representing choice under uncertainty in the presence of unforeseen contingencies, and to apply these models to improve understanding of the ‘precautionary principle’, commonly advocated as a guide to decisionmaking in relation to environmental problems where the consequences of alternative courses of action are not fully understood.

Work in this project has been undertaken jointly with Professor Simon Grant of Rice University, Texas, Jeff Kline of Bond University, Professor Flavio Menezes of the University of Queensland and visiting postdoctoral student Yusuke Osaki. The project produced a book chapter, five working papers and two conference papers in 2007.

Project: State-Contingent Production

This project continues a long-standing collaboration with Professor Robert G. Chambers of the University of Maryland, College Park. The central idea is to represent production under uncertainty using the representation of uncertain outputs as state-contingent production bundles, as first proposed by Arrow and Debreu in their Nobel prize-winning general equilibrium model. This approach can be integrated with modern methods of production theory, such as the application of duality theory.

Areas of application have included finance theory and analysis of risk aversion. The current focus is on empirical estimation on the integration of production and finance theory and on applications to comparisons of efficiency.

The project produced four journal articles and two working papers in 2007.

Australian Public Policy Program

Objectives

The aim of this program is to show how the latest advances in economic theory can help to illuminate the major issues in the Australian public debate, from the role of government and the market to the assessment of standards of living. The project will also help to bridge the gap between economics and other social sciences.

Project: Risk and Public Policy

Risk plays a central role in public policy today. The aim of this project is to examine the role of risk and risk management in policy areas ranging from criteria for public investment to reform of the criminal justice system. Areas studied in 2007 included privatisation and international comparisons of economic performance.

The project produced two journal articles and a working paper during 2007.

Project: Innovation in the information economy

This project addresses the changing nature of innovation in an economy in which the role of knowledge and information has been transformed by new technologies in computing and telecommunications, most notably the Internet. The project produced a conference proceedings paper and a working paper in 2007.

Climate Change Program

Objectives

The aim of this program is to analyse issues related to mitigation of, and adaption to, climate change. A fundamental premise of our research is that mitigation and adaptation are not competing alternatives but are necessary complements. In the absence of effective mitigation, climate change will be so rapid and extensive that adaptation will be impossible. On the other hand, even with a substantial mitigation effort, significant climate change is inevitable, and adaption will therefore be necessary.

Work on the Murray–Darling Basin, currently under way, illustrates these points. Under ‘business as usual’ simulations, there is a high probability that inflows of water to the Basin will decline to the point where irrigation ceases to be feasible in many regions, and sensitive environments are lost. On the other hand, if the rate of climate change is slowed through mitigation, and policies are adjusted optimally, only modest damage may be incurred.

The program produced four journal articles, two conference papers and a number of presentations and submissions to public inquiries during 2007.

Communication

An important object of the Group has been to make current research widely available as rapidly as possible. In addition to journal articles and conference papers, a variety of methods have been used to reach the broadest possible audience.

Web Site and Blog

A website has been developed at:

<http://www.uq.edu.au/rsmg>.

It provides reprints of journal articles and working papers, annual reports, information on staff activities and useful links. A weblog,

<http://www.johnquiggin.com/rsmg/wordpress>

provides occasional information on topics related to the work of the Group.

Working Papers

A working paper series has been established for each of the Programs listed above, and registered with RePeC, the main online repository for working papers in economics. More than fifty working papers are now available. A complete set of papers is available at:

<http://www.uq.edu.au/rsmg/publications-rsmg>.

The Group has also been active in public presentations, conferences, research seminars and contributions to print and electronic media.

Public Inquiries

It is important that research should be relevant to public policy. Members of the Group regularly make submissions to Parliamentary and other public inquiries. Although informed by research, views expressed in such submissions are those of the individual concerned.

Media

Professor Quiggin is a regular contributor to the *Australian Financial Review* and frequently writes on topics related to the work of the Group. In addition, he regularly provides comments on policy issues for radio, television, magazines and online publications.

List of publications

Book Chapters

- Grant, Simon and Quiggin, John (2007), 'Conjectures, refutations and discoveries: incorporating new knowledge in models of belief and choice under uncertainty' in Abdellaoui, M., Duncan Luce, R., Machina, M., and Munier, B. (eds) *Uncertainty and Risk: Mental, Formal, Experimental Representations*, Springer, Heidelberg, pp. 9–25.
- Quiggin, John (2007), 'Internet and innovation', in Fitzgerald B. (ed.) *Open Content Licensing: Cultivating the Creative Commons*, Sydney University Press, Sydney, pp. 150–155.

Journal Articles: Refereed

- Adamson, David, Mallawaarachchi, Thilak and Quiggin, John (2007), 'Water use and salinity in the Murray–Darling Basin: a state-contingent model', *Australian Journal of Agricultural and Resource Economics*, 51, 263–281.
- Allauddin, Mohammad and Quiggin, John (2008), 'Agricultural intensification, irrigation and the environment in South Asia: issues and policy options', *Ecological Economics*, 65, 111–124. (Published online in 2007 doi:10.1016/j.ecolecon.2007.06.004)
- Chambers, Robert G. and Quiggin, John (2007), 'Dual approaches to the analysis of risk aversion', *Economica*, 74(294), 189–213.
- Chambers, Robert G. and Quiggin, John (2007), 'Information value and efficiency measurement for risk-averse firms', *Journal of Productivity Analysis*, 27(3), 197–208.
- Chambers, Robert G. and Quiggin, John (2008), 'Narrowing the no-arbitrage bounds', *Journal of Mathematical Economics*, 44, 1–14. (Published online in 2007: doi:10.1016/j.jmateco.2007.04.001.
- Menezes, Flavio and Quiggin, John (2007), 'Games without rules', *Theory and Decision*, 63, 315–347.
- Neal, M., Neal, J. and Fulkerson W. J. (2007), 'Optimal choice of dairy forages in eastern Australia', *Journal of Dairy Science*, 90, 3044–3059.
- Quiggin, John (2007), 'The prime ministerial task group on emissions trading: advocacy and analysis', *Agenda*, 14(3), 5–14.
- Quiggin, John (2007), 'Reply to McKibbin and Robson', *Agenda*, 14(3), 27–28.

- Quiggin, John (2007), 'Ambiguity and the value of information: an almost-objective events analysis', *Economic Theory*, 30(3), 409–414.
- Quiggin, John (2007), 'Complexity, climate change and the precautionary principle' *Environmental Health*, 7 (3), 15–21.
- Quiggin, John and Chambers, Robert G. (2007), 'Supermodularity and the comparative statics of risk', *Theory and Decision*, 62(2), 97–117.
- Quiggin, John and van Veelen, C. Matthijs (2007), 'Multilateral indices: conflicting approaches?', *Review of Income and Wealth*, 53(2), 372–378.
- Sirasoontorn, Puree and Quiggin, John (2007), 'The political economy of privatisation in the Thai electricity industry', *Journal of the Asia Pacific Economy*, 12 (3), 403–19.
- Venn, Tyron and Quiggin, John (2007), 'Accommodating indigenous cultural heritage values in resource assessment: Cape York Peninsula and the Murray-Darling Basin, Australia', *Ecological Economics*, 61(2–3), 334–344.

Journal Articles: Other

- Gans, Joshua and Quiggin, John 'The practicalities of emissions trading', *Melbourne Review*, 3(2), 60–65.
- Quiggin, John (2007), 'Election 2007: Water policy', *Australian Review of Public Affairs*, September, <http://www.australianreview.net/digest/2007/election/quiggin.html>.
- Quiggin, John (2007), 'Issues in Australian water policy', *Australian Chief Executive*, February, 38–47.
- Quiggin, John (2007), 'Turning up the heat: say it isn't so', *The Walkley Magazine*, Issue 42, 16.
- Quiggin, John (2007), 'Net moves from Right to Left', *The Walkley Magazine*, Issue 45, 17.

Book Reviews

- Quiggin, John (2007), 'A pessimistic view of optimism', Review of Karen A Cerulo's *Never Saw It Coming: Cultural Challenges to Envisioning the Worst*, Chicago University Press, *Australian Financial Review*, 9 February, Review p. 5.

- Quiggin, John (2007), 'Spinning gold from straw, sometimes: on the commercial successes of the internet's "long tail"', Review of Chris Anderson's *Long Tail: Why the Future of Business Is Selling Less of More*, Hyperion (in the US), *Australian Financial Review*, 9 March, Review p. 3.
- Quiggin, John (2007), 'The greenhouse mafia', Review of Clive Hamilton's *Scorcher: The Dirty Politics of Climate Change*, Black Inc Agenda, *Australian Financial Review*, 1 June, Review pp. 4–5.
- Quiggin, John (2007), 'Economists do give a damn, after all', Review of Diane Coyle's *The Soulful Science: What Economists Really Do and Why It Matters*, Princeton University Press, *Australian Financial Review*, 20 July, Review pp. 3–4.

Reports and Submissions to Public Inquiries

- Gans, Joshua and Quiggin, John (2007), 'The practicalities of emissions trading', Submission to the Prime Ministerial Task Group on Emissions Trading, University of Melbourne and University of Queensland, 5 March.
- Mallawaarachchi, T., Yainshet, A., Adamson, D., Hone, S., Oliver, M., Kokic, P., Quiggin, J. and Gooday, P. (2007), Reduced water availability: impacts on agricultural activities and regional economies in the Murray–Darling Basin, Unpublished client report prepared by ABARE for the Murray–Darling Basin Commission, Canberra, November.
- Quiggin, John (2007), 'Issues in Australian water policy', Report published by the Committee for Economic Development of Australia (CEDA) as part of the CEDA/Fujitsu 2007 Economic and Political Overview, Sydney.
- Quiggin, John (2007), *The Risk Society: Social Democracy in an Uncertain World*, Centre For Policy Development Occasional Paper No. 2 (ISSN 1835-0135), Sydney.

Conference Papers

- Adamson, D. and Cook, D. (2007), 'Re-examining economic options for import risk assessments', Paper presented to the 51st Annual Conference of the Australian Agricultural and Resource Economics Society, Queenstown, New Zealand, 13–16 February.
- Adamson, D., Mallawaarachchi, T. and Quiggin, J. (2007), 'Climate change and climate uncertainty in the Murray–Darling Basin', Paper presented to the 51st Annual Conference of the Australian Agricultural and Resource Economics Society, Queenstown, New Zealand, 13–16 February.

- Tran, T.T., Adamson, D., Quiggin, J. and Wegener, M. (2007), 'Climate change and its implications for irrigators in the Murray–Darling Basin', Paper presented to the 51st Annual Conference of the Australian Agricultural and Resource Economics Society, Queenstown, New Zealand, 13–16 February.
- Quiggin, John (2007), 'Prevention, early intervention and the Smart State', Presentation to the Queensland Council of Social Service (QCOSS) Conference on 'Poverty, prosperity and progress: ensuring the inclusion of all Queenslanders', Brisbane, 26 March.
- Menezes, Flavio and Quiggin, John (2007), 'Can game theory be saved?' Paper presented to the 2007 Australasian Meeting of the Econometric Society, University of Queensland, Brisbane, 4 July.
- Grant, Simon, Kline, Jeff and Quiggin, John (2007), 'Lost in translation: honest misunderstandings and ex poste disputes', Paper presented at the 2007 Australasian Meeting of the Econometric Society, University of Queensland, Brisbane, 6 July.

Working Papers

***Murray–Darling Program* [ISSN: 1832-4266]**

- Concu, Giovanni B. (2007), 'Choice Modelling and laboratory experiments for non-market valuation: a framework', Murray–Darling Program Working Paper M07-1, Risk and Sustainable Management Group, University of Queensland, Brisbane. 22 February. (16 pages)
- Adamson, David, Mallawaarachchi, Thilak and Quiggin, John (2007), 'Climate change and climate uncertainty in the Murray–Darling Basin', Murray–Darling Program Working Paper M07-2, Risk and Sustainable Management Group, University of Queensland, Brisbane. 22 February. (15 pages)
- Adamson, David and Cook, David (2007), 'Re-examining economic options for import risk assessments', Murray–Darling Program Working Paper M07-3, Risk and Sustainable Management Group, University of Queensland, Brisbane. 22 February. (21 pages)
- Concu, Giovanni B. (2007), 'Willingness to pay and willingness to accept for changes in native vegetation cover', Murray–Darling Program Working Paper M07-4, Risk and Sustainable Management Group, University of Queensland, Brisbane. 29 October. (29 pages)

***Risk and Uncertainty Program* [ISSN: 1832-4258]**

- Neal, Mark (2007), 'Estimating complex production functions: the importance of starting values', Risk and Uncertainty Program Working Paper RO7-1, Risk and Sustainable Management Group, University of Queensland, Brisbane, 22 February. (31 pages).

- Osaki, Yusuke (2007), 'Noise risk and derivative price', Risk and Uncertainty Program Working Paper RO7-2, Risk and Sustainable Management Group, University of Queensland, Brisbane, 2 April. (10 pages).
- Osaki, Yusuke and Quiggin, John (2007), 'A risk-neutral characterisation of optimism and pessimism, and its applications', Risk and Uncertainty Program Working Paper RO7-3, Risk and Sustainable Management Group, University of Queensland, Brisbane, 2 April. (12 pages).
- Menezes, Flavio and Quiggin, John (2007), 'Can game theory be saved?', Risk and Uncertainty Program Working Paper RO7-4, Risk and Sustainable Management Group, University of Queensland, Brisbane, 1 February. (15 pages).
- Quiggin, John and Chambers Robert G. (2007), 'Bargaining power and efficiency in insurance contracts', Risk and Uncertainty Program Working Paper RO7-5, Risk and Sustainable Management Group, University of Queensland, Brisbane, 15 March. (20 pages).
- Menezes, Flavio and Quiggin, John (2007), 'Sharp and diffuse incentives in contracting', Risk and Uncertainty Program Working Paper RO7-6, Risk and Sustainable Management Group, University of Queensland, Brisbane, 15 March. (15 pages).
- Menezes, Flavio and Quiggin, John (2007), 'Markets for influence', Risk and Uncertainty Program Working Paper RO7-7, Risk and Sustainable Management Group, University of Queensland, Brisbane, 15 March. (7 pages).
- Chambers Robert G., Hailu, Atakelty, and Quiggin, John (2007), 'Event-specific data envelopment models and efficiency analysis', Risk and Uncertainty Program Working Paper RO7-8, Risk and Sustainable Management Group, University of Queensland, Brisbane, 1 November. (20 pages).

Australian Public Policy Program [ISSN: 1832-424X]

- Quiggin, Robynne and Quiggin, John (2007), 'Intellectual policy and indigenous culture', Australian Public Policy Program Working Paper PO7-1, Risk and Sustainable Management Group, University of Queensland, Brisbane. 25 February. (18 pages)
- Quiggin, John (2007), 'Risk and social policy', Australian Public Policy Program Working Paper PO7-2, Risk and Sustainable Management Group, University of Queensland, Brisbane. 1 November. (16 pages)
- Bell, Stephen and Quiggin, John (2007), 'Beyond Stop/Go?: Explaining Australia's Long Boom', Australian Public Policy Program Working Paper PO7-3, Risk and Sustainable Management Group, University of Queensland, Brisbane. 18 November. (15 pages)

Climate Change Program [ISSN: 1835-7245]

- Quiggin, John (2007), 'Stern and his critics on discounting and climate change', Climate Change Program Working Paper CO7-1, Risk and Sustainable Management Group, University of Queensland, Brisbane. 19 June. (14 pages)
- Quiggin, John (2007), 'Declining inflows and more frequent droughts in the Murray–Darling Basin: climate change, impacts and adaption', Climate Change Program Working Paper CO7-2, Risk and Sustainable Management Group, University of Queensland, Brisbane. 1 July. (28 pages)
- Quiggin, John (2007), 'Complexity, climate change and the precautionary principle', Climate Change Program Working Paper CO7-3, Risk and Sustainable Management Group, University of Queensland, Brisbane. 1 July. (15 pages)
- Gans, Joshua and Quiggin, John (2007), 'The practicalities of emissions trading', Climate Change Program Working Paper CO7-4, Risk and Sustainable Management Group, University of Queensland, Brisbane. 6 August. (6 pages)
- Quiggin, John (2007), 'Counting the cost of climate change at an agricultural level', Climate Change Program Working Paper CO7-5, Risk and Sustainable Management Group, University of Queensland, Brisbane. 2 October. (21 pages)

Presentations

- Quiggin, John (2007), 'Urban water: markets and planning', conference dinner presentation at the Australian Academy of Science's 2007 Fenner Conference on the Environment on 'Water, population and Australia's urban future', Canberra, 15 March.
- Quiggin, John (2007), 'Anderson's idea of The Long Tail', presentation to a joint research symposium on 'Digital Literacy and Creative Innovation in a Knowledge Economy', sponsored by the ARC Centre of Excellence for Creative Industries and Innovation (CCi), and the Cultural Research Network (CRN), Queensland University of Technology, Brisbane, 30 March.
- Quiggin, John (2007), 'The future of Federalism', presentation (sponsored by the Evatt Foundation) to the Fringe Program at the ALP's 2007 National Conference, Sydney, 28 April.
- Adamson, David and Mallawaarachchi, Thilak (2007) 'Impacts of reduced water availability on agricultural activities and regional economies in the Murray–Darling Basin: Stage 1 modelling results', Presentation to the Murray–Darling Basin Commission, Canberra, 9 May.

- Quiggin, John (2007), 'What would life be like with an Australian emissions trading regime?', presentation to the Committee for the Economic Development of Australia (CEDA) Queensland luncheon program, Brisbane, 9 May.
- Quiggin, John (2007), 'Reason, interests and ideology in the climate change debate', presentation to the Rationalist Society of Australia, Brisbane Chapter, Brisbane, 11 July.
- Quiggin, John (2007), 'Climate change and the role of economists in developing appropriate policy responses', presentation to the Economics Alumni's Annual General Meeting, University of Queensland, Brisbane, 24 July.
- Quiggin, John (2007), 'Can the family farm survive?' Presentation to the SA Agribusiness Conference, Adelaide, 26 July.
- Quiggin, John (2007), 'Global warming: consequences for small to medium businesses', presentation to the CEO Institute, Brisbane, 1 August.
- Quiggin, John (2007), 'An energy exporter confronts climate change', presentation to the Russia–Australia Business Forum co-hosted by the Honourable Peter Beattie MP, Queensland Premier and Minister for Trade, Queensland Parliament House, Brisbane, 5 September.
- Quiggin, John (2007), 'Research with impact', presentation to the BEL Faculty's Research Colloquium, University of Queensland, Brisbane, 17 September.
- Quiggin, John (2007), 'Emissions trading', presentation to CS Energy, Brisbane, 28 September.
- Quiggin, John (2007), 'Blogging and self-branding', Presentation to Monthly MACS, ARC Cultural Research Network, Centre for Critical and Cultural Studies, University of Queensland, Brisbane, 12 October.
- Quiggin, John (2007), 'Coral reefs and the nascent economics of resilience', Presentation to a National Forum on Coral Reef Futures sponsored by the ARC Centre of Excellence for Coral Reef Studies, Canberra, 18 October.
- Quiggin, John (2007), 'Thinking about climate change', Presentation to the Australian Mensa Conference, Brisbane, 27 October.

Community service, outreach and media

Entries in this section are for Professor John Quiggin, except where otherwise noted.

Community Service and Outreach

- Discussion panellist, 'The Truth about Water', Queensland Economic Society, Brisbane, 5 April 2007. (David Adamson)
- Participated in a CEDA panel discussion on 'What life would be like with an emission trading regime?', Brisbane, 9 May 2007.
- Participated in the Big Issues expert panel discussion held by the Committee for Economic Development (CEDA), Sydney, 1 June 2007.
- Address on 'Resource allocation in universities' to the National Tertiary Education Industry Union (NTEU) Forum on 'Fair shares at UQ', University of Queensland, Brisbane, 6 June 2007.
- Attended a roundtable on 'Resilience' hosted by Australia 21, Sydney, 17 July 2007.
- Presentation of keynote address on 'Can economists save the planet?' to the UQ Economics Schools Day, University of Queensland, Brisbane, 19 July 2007.
- Participation in a Socratic Forum on the topic 'That Canberra is taking too much power from the states', supported by the Key Centre for Ethics, Law, Justice and Governance; Institute for Ethics, Governance and Law (a joint initiative of the UN University, Griffith, QUT and ANU); and the Australian Research Council Governance Research Network (GovNet), Legislative Council Chamber, Parliament House, Brisbane, 29 August 2007.
- Discussion leader for a session on 'Australia after the next election' at the Australian Leadership Retreat on 'Harnessing the shifting power equation' sponsored by the Australian Davos Connection and the World Economic Forum, Hayman Island, Queensland, 1 September 2007.
- Lead contributor for a session on 'Sustainability and environmental change: Where are we? Where next?' at the Australian Leadership Retreat on 'Harnessing the shifting power equation' sponsored by the Australian Davos Connection and the World Economic Forum, Hayman Island, Queensland, 1 September 2007.
- Discussion leader for a session on 'Thirsting for a water solution' at the Australian Leadership Retreat on 'Harnessing the shifting power equation' sponsored by the Australian Davos

Connection and the World Economic Forum, Hayman Island, Queensland, 2 September 2007.

- Introductory remarks for a session on 'Buyouts, blogs or boredom: Who is killing print' at the Australian Leadership Retreat on 'Harnessing the shifting power equation' sponsored by the Australian Davos Connection and the World Economic Forum, Hayman Island, Queensland, 2 September 2007.
- Panelist at the Introductory Panel Discussion on 'Blogging' at the Australian Blogging Conference hosted by the QUT Faculty of Law and the ARC Centre of Excellence for Creative Industries & Innovation (CCI), Queensland University of Technology, Brisbane, 28 September 2007.
- Presentation on 'Strategies and approaches to writing grant applications' for the ARC Grant Writing seminar for Humanities, Creative Arts, Social, Behavioural and Economic Sciences sponsored by the Research and Research Training Division, University of Queensland, Brisbane, 10 December.

Editorial Boards

Economic Theory; Journal of Risk and Uncertainty; Australian Economic Papers; Journal of Economic and Social Policy; Australian Journal of Agricultural and Resource Economics; Economic and Labour Relations Review; Environmental and Resource Economics,

Australian Financial Review

- 'Handling those global warming hot potatoes', 6–7 January 2007, p. 63.
- 'War: deadly game for losers', 18 January 2007, p. 46.
- 'Water remedy clear as mud', 1 February 2007, p. 54.
- 'Hot heads won't save us', 15 February 2007, p. 62.
- 'Pooh to copyright wrongs', 1 March 2007, p. 70.
- 'Still, life's not bad here', 15 March 2007, p. 62.
- 'Denial lobby strikes again', 29 March 2007, p. 58.
- 'No discount on equality', 12 April 2007, p. 62.
- 'Perhaps a rational solution', 26 April 2007, p. 62.

- 'Climate right for the next big idea', 10 May 2007, p. 71.
- 'The three Ps for politicians', 24 May 2007, p. 62.
- 'Real danger in solo action', 7 June 2007, p. 62.
- 'Infrastructure time bombs', 21 June 2007, p. 70.
- 'Old policies, loudly restated', 5 July 2007, p. 62.
- 'Tax reform the way to go', 19 July 2007, p. 62 .
- 'Sub-prime no threat, so far', 2 August 2007, p. 70.
- 'Denial industry in full cry', 16 August 2007, p. 62.
- 'Beware the PPP pitfalls', 30 August 2007, p. 70.
- 'Time for PM to backflip', 13 September 2007, p. 70.
- 'A lot hangs in the balance', 27 September 2007, p. 70.
- 'Fixed terms make sense', 11 October 2007, p. 74.
- 'Commitment cuts too deep', 25 October 2007, p. 79.
- 'Trick is managing a soft landing', 8 November 2007, p. 79.
- 'Our world really is ending', 22 November 2007, p. 74.
- 'Greener future is permitted', 6 December 2007, p. 62.
- 'Temma's power failure', 20 December 2007, p. 46.

Media Interviews

- ABC TV (Lateline), 'Water', 6 February 2007.
- ABC (Radio National), 'Unemployment and participation rates', 8 February 2007.
- ABC Radio (Brisbane), 'Carbon trading', 9 February 2007.
- ABC (Radio National: AM), 'Water', 9 February 2007.
- ABC (Radio National: News), 'Water', 11 February 2007.
- ABC (Radio National: Breakfast), 'Water', 12 February 2007.

- ABC Radio (Canberra), 'Water', 12 February 2007.
- ABC Radio (Drivetime: Brisbane), 'Electricity', 19 February 2007.
- ABC Radio (Townsville), 'Dead zones and climate change', 20 February 2007.
- *Courier Mail*, 'Electricity privatisation', 21 February 2007.
- ABC International TV, 'United Nations' Global Water Day', 15 March 2007.
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- Planet Radio, 'Water', 3 May 2007.
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- ABC TV (7.30 Report), 'Dalrymple Bay', 30 May 2007.
- ABC Radio (Brisbane), 'Privatisation of Australia Post', 4 June 2007.
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- *Australian*, 'Queensland budget and debt', 5 June 2007.
- *Courier Mail*, 'Future of the Australian economy', 28 June 2007.
- *Adelaide Sunday Mail*, 'Climate change', 19 July 2007.
- ABC Radio (Australia Talks), 'Internet and democracy', 23 July 2007.
- ABC Radio (Queensland), 'Coal exports', 24 July 2007.

- Radio Adelaide, 'Climate change', 26 July 2007.
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- ABC (Radio National: Saturday Extra), 'How to spend the Federal budget surplus', 25 August 2007.
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- *Bulletin*, 'Oil prices', 18 October 2007.
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- *Courier Mail*, 'Baby bonus and carbon taxes', 10 December 2007.
- ABC Radio (Life Matters), 'Climate change and low income families', 12 December 2007.

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Title

Sustainable reform of the Murray–Darling system: property rights, uncertainty and institutions

Project Summary

The project will develop tools for the modelling of uncertainty in the absence of probabilities and with imperfect knowledge about possible events. It will also formalise and assess the precautionary principle for the sustainable management of complex systems. Finally, the project will apply these tools to analyse and improve policies for the reform of property rights, institutions and land and water management in the Murray–Darling system. The project will assist in the formulation of sustainable responses to problems of drought and irrigation-related salinity in the Murray–Darling system.

Project Objectives

The aim of this project is to use recent developments in the analysis of property rights and the theory of choice and production under uncertainty to provide a rigorous basis for the use of the precautionary principle in the management of complex economic–ecological systems. These developments will be applied to the design, modelling and evaluation of policies designed to promote ecologically, economically, and socially sustainable reform of the Murray–Darling system.

Progress for 2007

Analysis of the formal model of choice under uncertainty has been extended, with the development of a probabilistic notion of belief revision, and the publication of numerous applications of the state-contingent production approach.

Both the short-term problems associated with the current drought and longer term problems of allocating scarce water resources were addressed in journal articles, policy articles, newspaper articles and other contributions to public debate. Proposals for a personal water allowance policy to replace existing multiple-block tariffs and water restrictions received particular attention.

In the light of the rapid increase in public concern and policy debate concerning climate change, this became a central focus of research effort during 2007, an effort will be continued into the new Federation Fellowship. A number of invited articles were prepared for interna-

tional journals in non-economics fields, notably including an assessment of the Stern Review for leading climate journal *Climatic Change*.

This project ended on 31 December 2007. Most areas of research effort will continue into the new Fellowship.

