
Case for Promotion

Robert Ernest MARKS

Currently: Since 1995, Associate Professor, AGSM.

Previous Appointments

University of New South Wales, Australian Graduate School of Management:

1981–1994 Senior Lecturer,

1977–1981 Lecturer.

The Santa Fe Institute:

1993 Visiting Researcher, Economics Group.

Stanford University:

1992–1993 Visiting Scholar, Graduate School of Business,

1980–1981 Visiting Assistant Professor, Engineering-Economic Systems,

1976–1977 Lecturer, Engineering-Economic Systems,

1973–1974 Teaching Assistant, Engineering-Economic Systems.

University of California at Berkeley:

1984 Visiting Scholar, Energy and Resources Group.

National Bureau of Economic Research – West, (Stanford):

1975–1977 Research Assistant.

Massachusetts Institute of Technology:

1984 Visiting Scholar, Center for Energy Policy Research.

1969–1970 Research Assistant, Urban Systems Laboratory.

Commonwealth Scientific and Industrial Research Organisation:

1969 Research Officer, Division of Building Research.

University of Melbourne:

1969 Tutor, Mathematics, Ormond College,

1968–1969 Demonstrator, Structural Engineering.

Overview of the Case for Promotion

The basis of my case is an outstanding record in innovation in research, applying economic theory to understanding market phenomena and to social policy. In addition, I have made a major contribution to the University and the AGSM. I have also taught all the School's stakeholders: MBAs, PhDs, and executive participants, with above-average results.

The evidence supports my research record, both in terms of its significance and in its impacts in academia internationally and on social policy. Its significance is indicated by the invitations, publications, presentations, citations, and funding outlined below. Career publications number 122 (50 since my last promotion), including 24 (6) in refereed journals, 13 (5) in refereed proceedings, 5 (3) books, 9 (7) book chapters, and 8 (8) editorials. In addition, I received a large ARC grant (as

sole P.I. while not yet an Associate Professor) and a series of small grants which have afforded me nine years of research support. As the first economist to combine game theory and machine learning to study strategic interactions and oligopolistic behaviour, I have been invited to join the program committees of several international conferences covering this area, as well as paid invitations to present at institutions in Europe (the Max Planck Institute, Germany) and the U.S.A. (U.C.L.A. and the Santa Fe Institute). The use of such simulations in economics is now rapidly growing.

My service to both University and School has been extensive. It includes the following: in the University I have been a member of the University Council, and member of the ERDIC advisory committee and the Institute of Environmental Studies management committee; at the AGSM I have been a two-term member of the Board of Management, General Editor of the *Australian Journal of Management*, director of the MBA program, and the longest serving Cluster Head (of Economics), the AGSM's equivalent of Head of School, for almost eight years. These contributions have occurred while I carried a regular teaching load, with above-average teaching evaluations across the range of AGSM programs. (At the AGSM, Cluster Heads have almost without exception been full professors.)

Summary of Research Achievements.

My research has involved the application of economic theory to several issues which are increasingly important: the abuse of illicit drugs, the environmental impacts of energy use, and strategic behaviour in markets with small numbers of sellers, using game theory and economics to model learning and adaptive behaviour in oligopolies. With Ph.D. students, I have also written on the evolution and structure of the Australian coal industry, and the relative efficiency of state-owned enterprises in China.

I wrote the first definitive analysis of the history and institutions of Australian energy policy (1986). I was a leading member of a team who prepared an influential report for CRA Ltd. on the costs of reducing Australian CO₂ emissions (1989). I was the first economist to present work using machine learning to develop artificially intelligent adaptive economic agents, for studying learning behaviour, oligopolistic strategies, and the evolution of economic institutions.

The impacts of my work are evidenced by reviews in learned journals by distinguished economists, such as Nobel laureates Robert Solow and, in a testimonial, Milton Friedman (Appendix 2), by Government studies that rely on my results, such as an Industry Commission greenhouse study and Government monographs on the costs of drug abuse, by invitations to collaborate with colleagues at such institutions as the Santa Fe Institute, by invitations to join editorial boards (Section 5.3), by invitations to referee grants applications and submissions for international journals (Sections 5.4 and 5.5), and by invitations to join the program committees of international conferences (Section 5.6).

Summary of Teaching Achievements.

Teaching at the AGSM occurs at the levels of the MBA (our flagship program), the Ph.D., and the Executive Programs. My main contributions have been in the MBA program, in which I would highlight four subjects: Management in Society (a

newly originated gateway subject, taken by all incoming MBA/MPA students, 1977–1984), Microeconomic Analysis (a newly originated subject for quantitatively trained students, 1986–1997), Strategic Game Theory for Managers (a newly originated subject in 1992 introducing strategic interactions in negotiation and bargaining), and Economic Investment Appraisal (1985–). I have obtained above-average student assessments (Section 8.1). I was also a director of a three-day executive program on resource economics (1981–84), of a two-day program on strategic thinking (1997–), and co-director of a two-day program on managerial decision making (1997–) (Section 8), and have graduated three doctoral students, a performance which puts me well above the School average in terms of doctoral students graduated (Section 5.2).

Summary of Service Achievements.

I was elected to the University Council (1986–1988), and the AGSM Board of Management (1989–1992, two terms). I was appointed to the Committee to Select a Pro-Vice Chancellor in 1988. I have served on the Advisory Council of the UNSW Energy Research Development and Information Centre (since 1989) and was the Academic Board nominee to the Management Committee for the UNSW Institute of Environmental Studies (1993–99). In the AGSM, I served as the Director of the MBA Program and presiding member of the Admissions sub-committee in 1979–1980, a crucial time in the School's development, when the first Dean, Professor Phillip Brown, stood down, and before the second Dean, Professor Jeremy Davis, had arrived. Since 1997 I have been the General Editor of the *Australian Journal of Management* (Section 5.3). In 1993 I was appointed Head of Economics at the School, and have since hired four permanent faculty members and twelve adjunct teaching faculty (Section 9.2).

1. Highlights of Research Achievements.

As a microeconomist at a business school, I have been drawn to the examination of markets: markets for energy (sometimes regulated), markets (or their absence) for environmental services, markets (often “black” but otherwise unregulated) for drugs, markets with a small number of sellers — oligopolies. My research has revolved around the application of economic theory to several social issues associated with these markets.

My policy research has been related to energy policy and to drug policy, through the issue of altering individuals' (or organisations') behaviour. In the case of global warming, which links the use of carbon-based fuels to possibly severe environmental impacts, the issue is to encourage behaviour to conserve energy; in the case of drug policy, the issue is to encourage responsible drug use, or no illicit drug use at all, in some instances.

Energy-policy and drug-policy research has led to the study of instruments to reduce individuals' and organisations' energy use — and use of environmental resources — and instruments to affect individuals' drug-taking behaviour. In place of the coercion of the criminal-justice system towards drug use and the exhortation of some environmentalists towards energy use, I have analysed the effectiveness and equity of market-based solutions.

This work has led me to examine the changing nature of organisations and economic institutions, in response to the changing external environment, and to repeated *strategic* interactions, such as the rivalry among the small number of sellers in an oligopoly. My research into learning and adaptive strategic market behaviour, using game theory and machine learning, is a new approach.

1.1 Game Theory and Economic Evolution

Oligopolistic markets, with price-setting firms involved in a strategic “dance” with their rivals, selling goods or services that are close (but not perfect) substitutes, include markets for brand-differentiated items, such as ground coffee at the retail level, air travel, gasoline, and cola-based soft drinks. Over the last twenty years there has been a very fruitful interaction between the theories of non-cooperative games and oligopolistic behaviour, resulting in use of the concepts of dynamic equilibria, which has meant that phenomena such as price wars can be characterised as the outcomes of non-cooperative games. I have been interested in the characterisation of equilibria (Markov Perfect), and in estimating the relationship between market structure and strategic behaviour, a disequilibrium approach of long-standing interest to me.

With Professor David Midgley of INSEAD, Paris, and Professor Lee Cooper of U.C.L.A. I have used marketing data to examine how players in iterated oligopolies respond to their rivals’ behaviour, and have used machine learning to derive improved contingent strategies for such markets, which provide insights into the evolution of such markets and the patterns of behaviour observed. In such markets, external stimuli may lead to prices changing from one period to the next, but for most periods, the player’s new price level and the levels of its other marketing instruments are determined by rivals’ past actions. Issues addressed are: how past actions determine present actions, which past marketing instruments are relevant, and what depth of memory is sufficient. This work was published as the lead paper in *Management Science* in 1997 (Paper 6).

Using the Genetic Algorithm (GA), a then new optimisation technique from machine learning, I became the first economist in the world to publicly present the results of using the GA to examine an economic issue in 1988 (Paper 35): determining oligopolistic behaviour in repeated strategic interactions by creating “artificially intelligent adaptive economic agents”. Representing these strategies led me to the concepts of finite automata and their graphical representations from computer science (Paper 12). This in turn led me to means of conceptualising and measuring the complexity of such strategic behaviour, and to the partitioning of data by market participants in determining their next action (Papers 4 and 27).

Within the framework of repeated games, rationality demands a high level of pattern recognition, memory, and computing. The concept of “bounded rationality”, in which the memory, or the computing ability, or competence at pattern recognition of the actors are limited, may, however, be sufficient to generate the observed behaviour, particularly dynamic oligopolistic behaviour. I model economic actors as boundedly rational stimulus-response automata, which can be estimated from historical data.

Advances in game theory and oligopoly theory and the development of machine learning have allowed such a research program to be undertaken. No-one else has examined the estimation of automata from patterns of stimulus-response behaviour in repeated strategic interactions. No-one else has used such estimated

machines with machine learning to search for better contingent strategies (Paper 43). Such research is especially valuable in an business school, because it advances our understanding of oligopolistic behaviour and the theory of repeated strategic interactions, to suggest ways in which sellers in such a market can improve their performance, and to point to improvements in the efficiency of resource allocation (Paper 54).

This line of research has resulted in invitations to make presentations at many overseas workshops and conferences (Section 5.1). It has also resulted in invitations to act as reviewer for the *Journal of Evolutionary Economics* (Germany), *Complexity* (U.S.A.), the *Journal of Economic Dynamics and Control* (U.K.), the *Journal of Economic Behavior and Organization* (Netherlands), the *Australian Journal of Agricultural and Resource Economics*, and *Computational Economics* (Netherlands). It has also resulted in invitations to act as a session convener and as a member of the program committee for six international conferences (Section 5.6).

In early 1996 a conference was held at the UNSW with participants from Europe, Asia, Australia, and the U.S.A. After extensive culling, editing, and rewriting of the contributions, the Cambridge University Press volume (Paper 38) appeared a year ago. Dr. Marks was a convener, co-editor, and contributor.

1.2 Energy/Environmental Policy

I have a continuing interest in exhaustible resources, and this has led to the papers on energy policy, the world oil market, and the Australian coal market. I wrote the definitive analysis of Australian energy policy (Paper 21).

My interest in energy policy meant that energy-related environmental issues, such as global warming, were an obvious application. Indeed, a joint consulting project for CRA Ltd. on the cost of Australia's reducing CO₂ emissions generated several papers, which attracted much attention and have been influential with policy-makers, culminating with a presentation before Federal Parliament (Paper 69). I have been invited to act as a reviewer in this area by the *Journal of Environmental Economics and Management*, the *Economic Record*, and *The Energy Journal*.

1.3 Drug Policy

I have been studying drug policy for almost thirty years, publishing one of the first papers to analyse the drug issue using a supply/demand framework (Paper 20). I published several papers on Australian drug policy, which have been influential in the drug-policy debate in Australia¹ and abroad. There are two significant achievements of this work: I obtained previously confidential and unique "inside" data on the structure of the illicit Australian heroin distribution system collected by the black-marketeers themselves, which together with other studies both here and abroad has permitted me to examine the costs and rewards of the drug-distributing and in some cases of the drug-using network. Professor Milton Friedman, Nobel laureate in Economics, has characterised these data as "particularly interesting and unique" (see Appendix 2). My other significant achievement in this area is that it is the first serious attempt to estimate the social costs of illicit drug use in Australia. A recent paper [124] contrasts the development of policies on greenhouse gas emissions and on drug policy in Australia, drawing together the previous two research topics.

Public reaction to my work included an editorial in the *Sydney Morning Herald* on 9 May 1989, and an editorial in the February 1994 issue of the *Independent Monthly* (see Section 10.1).

1.4 Work in Progress

Work in progress falls mainly into the game theory/economic evolution/oligopoly area of investigation, although work with current and past Ph.D. students continues to be submitted to good journals. In providing the machine-learning genetic algorithm with appropriate environments, given limited data, I became interested in the econometrics of estimating finite automata as descriptions of firms' stimulus–response strategies in repeated interactions. Specification of the model is crucial: the number of rounds remembered, the thresholds of perception or action, the issue of the number of possible states. Synthetic data and historical data can be used to explore this area.

The economist's intuition is that since more complex automata are able to play more complicated strategies (by remembering longer or counting longer, for instance), they should be able to perform better. But if there is a cost to complexity (the cost of design, the cost of choice, the cost of maintenance) then there may be a point of diminishing returns. Experiments in which more complex strategies can evolve and compete, but with some penalty for their complexity, should reveal whether the intuition holds.

Computer experiments (or simulations) allow us to examine so-called emergent phenomena, which owing to intractable complexity may be beyond our abilities to analyse with closed-form mathematical descriptions. The cost is the absence of necessary conditions, although sufficiency remains. The increasing use of these techniques would be standardised by an agreed protocol.

Paper 5 introduced a model of a strategic player in a repeated interaction as a stimulus–response machine. But the issue remains of how to estimate the model in a particular interaction, with historical data. The research program started in 1988 continues.

In summary: I see my past and current research as clearly linked. My work on policy and oligopolistic behaviour exemplifies an economics view: of examining actual behaviour and analysing ways in which this can be improved, both from the point of view of the market participants (most recently, sellers in an oligopoly) and from the point of view of society.

2. Grants Received:

Note that, with the exception of 1993 (when Dr. Marks was on SSP), he has had research support for the nine years 1992–2001.

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| 2000 | AGSM Small Grant (Chief Investigator): “Modelling rivalry in mature, repeated oligopolies: players learn rules of thumb in perceiving responding and signalling.” (\$15,000) |
| 1999 | Australian Research Council Small Grant (Chief Investigator): “Strategic rivalry in mature oligopolies: endogenising and estimating players' perceptions, responses, and actions.” (\$19,900) |
| 1998 | Australian Research Council Small Grant (Chief Investigator with David Midgley): “Benchmarking learned responses and rules of thumb in mature oligopolies.” (\$18,000) |

- 1997 AGSM Special Research Grant (Principal Investigator, with David Midgley): “Benchmarking learned responses and rules of thumb in mature oligopolies.” (\$9,000)
- 1995 Australian Research Council Large Grant (Principal Investigator; with David Midgley): “Strategic behaviour and learning: estimation and simulation of pricing and promotion in iterated oligopolies.” (\$75,000) (The ARC Advisory Panel Score: 90–94%)
In winning this grant as the sole P.I. while still a Senior Lecturer, I achieved success unprecedented at the AGSM. (The grant was announced in late 1994 several weeks before the promotion occurred.)
- 1995 Australian Vice Chancellors’ Committee Electronic Publishing Working Group (with John Roberts, Chris Sauer, Pam Taylor, et al.): “Technical trial and study of consumer adoption patterns.” (\$76,140)
(This was also attained while I was still a Senior Lecturer.)

Earlier grants were noted in the case for promotion to Associate Professor.

- 1994 Worksafe Australia Research Grant (with Jean Cross, Principal Investigator): “The costs and benefits of safety programs.” (\$102,000)
- 1992 Australian Research Council Small Grant (Principal Investigator, with David Midgley): “Strategic behaviour and the evolution of economic institutions.” (\$18,000)

3. Publication summary.

Category	A	B	C	D	E	F	G	H	I	Total
Career total	24	13	5	9	25	0	0	6	40	122
Total since app’t at present level	6	5	3	7	12	0	0	2	15	50

My best five papers: [5], [6], [8], [9], [12], and book: [25]. These are the papers I believe include my best research work, and which I have successfully submitted to tier-1 journals. As my most recent research has been pioneering and specialist, I am pleased that I have been able to obtain acceptance in top-level journals: the *Journal of Economic Dynamics and Control* [5], *Management Science* [6], and the *Journal of Evolutionary Economics* [12].

I have a career total of 82 citations from all three Citation Indices, although this may understate actual citations, given the interdisciplinary nature of the fields I have worked in. For instance, there have been citations in many journals not covered by the Web of Science, such as *Complexity* (U.S.A.) and such books as the U.N. *World Drug Report*, O.U.P., 1997, and Access Economics’ *Economics Monitor*, 1997.

3.1 A: Papers and Reviews in Refereed Journals

- [1] Kong X., Marks R.E., and Wan G.H. (1999) "Technical efficiency, technological change and total factor productivity growth in Chinese state-owned enterprises during the early 1990s," *The Asian Economic Journal*, **13**(3): 267–281, September. (30%)
- [2] Kong X., Marks R.E. and Wan G.H. (1999), "Guo you qi yue quan yao su sheng chan li ji qi jue ding ying su: 1990–1994 [Total factor productivity and its determinants of Chinese state-owned enterprises: 1990–1994]," *Jingji Yanjiu [Economic Research]*, July (No. 7), pp. 40–48. [In Chinese] ISSN 0577-9154 (30%)
Economic Research — known as *Ching Chi Yen Chiu* using the Giles-Wade system of transliteration — is published by the Institute of Economics, Chinese Academy of Social Sciences in Beijing. It is the leading economics journal in China.
<http://ealib.lib.umn.edu/jjyjiu/jjyj997.html>
- [3] Marks, R.E. (1999) Review of *Neural Networks for Economic and Financial Modelling*, by Andrea Beltratti, Sergio Margarita and Pietro Terna, (London: International Thomson Computer Press), 1996, *Journal of Artificial Societies and Social Simulation*, **2**(2): March.
<<http://www.soc.surrey.ac.uk/JASSS/>> ISSN 1460-7425
- [4] Marks, R.E., Midgley, D.F., Cooper, L.G. and Shiraz, G.M. (1999), "The complexity of competitive marketing strategies," *Complexity International*, **6**, 1999. (60%)
<<http://life.csu.edu.au/complex/ci/vol6>> ISSN 1320-0682
- [5] Marks, R.E. (1998) "Evolved perception and behaviour in oligopolies," *Journal of Economic Dynamics and Control*, **22**(8–9): 1209–1233, July.
(A tier-1 economics journal.)
- [6] Midgley, D.F., Marks, R.E., and Cooper, L.G. (1997) "Breeding competitive strategies," *Management Science*, **43**(3): 257–275, March. (55%)
This paper was the lead article in its issue. (A tier-1 economics journal.)

Earlier papers were noted in the previous promotion documents.

- [7] Marks, R.E. (1994) "Cannabis laws: an analysis of costs," *Drug and Alcohol Review*, **13**(3): 341–346.
- [8] Marks, R.E. (1993) "Modelling heterogeneous inputs," *Economics Letters*, **42**(2–3): 167–171.
- [9] Marks, R.E. and Swan, P.L. (1993) "Exhaustibility and the reserves/production ratio," *Economics Letters*, **42**(1): 117–119. (60%)
- [10] Marks, R.E. (1993) Review of *Risk, Organizations, and Society. Studies in Risk and Uncertainty*, ed. by Martin Shubik. (Dordrecht: Kluwer Academic Publishers, 1991), in *Economic Record*, **69**(204): 82–83.
- [11] Marks, R.E. (1992) "The costs of Australian drug policy," *Journal of Drug Issues*, **22**(3): 535–547.

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- [12] Marks, R.E. (1992) "Breeding optimal strategies: optimal behaviour for oligopolists," *Journal of Evolutionary Economics*, **2**: 17–38.
E.S. Andersen, *Evolutionary Economics: Post-Schumpeterian Contributions*, London & N.Y.: Pinter, 1994. "Marks summarises an attempt to go from the simple Prisoner's Dilemma to a Generalised Prisoner's Dilemma for studying the pricing behaviour of oligopolists using a kind of TIT-FOR-TAT strategy; furthermore, he tries to show how the genetic algorithm can be used for generating strategies for this game and thus give some indications of the emergence of the (relative) evolutionary stability of the successful strategies." fn 20, p. 182.
- Professor James D. Laing of the Wharton School, Department of Operations and Information Management, uses this paper as required reading in the course, OPIM 319: *Seminar in Advanced Decision Systems: Evolutionary Computation*, (Spring 1996), Section 11, Applying evolutionary computation to economic theory. (See <http://opim.wharton.upenn.edu/dworman/opim319/ds319s96.html>)
- [13] Marks, R.E. (1991) "What price prohibition? An estimate of the costs of Australian drug policy," *Australian Journal of Management*, **16**(2): 187–212, (December).
(Note: Extract reprinted in Peter Mitchelson & Andrew Mann, *Economics for Business*, Melbourne: Thomas Nelson, 1995.)
- [14] Marks, R.E. (1991) "Reducing carbon dioxide emissions from Australian energy use," *The Science of the Total Environment*, **108**(1–2): 111–121, (October).
- [15] Marks, R.E., P.L. Swan, P. McLennan, R. Schodde, P.B. Dixon, and D.T. Johnson, (1991) "The cost of Australian carbon dioxide abatement," *The Energy Journal*, **12**(2), 135–152, (April), plus a Corrigendum, *The Energy Journal*, **12**(4), 149–150.
- [16] Marks, R.E. (1990) "Prohibition or regulation: an economist's view of Australian heroin policy," *Australian and New Zealand Journal of Criminology*, **23**(2): 65–87, (June).
- [17] Marks, R.E. (1990) "A freer market for heroin in Australia: alternatives to subsidizing organized crime," *Journal of Drug Issues*, **20**(1): 131–176, (Winter).
- [18] Marks, R.E. (1989) "Towards 2000: Australian energy policy and conservation," *Energy Exploration & Exploitation*, **7**(1): 37–50.
- [19] Marks, R.E. (1987) Review of *Money, Accumulation and Crisis*, by D.K. Foley, (Chur, Switzerland: Harwood Academic Publishers, 1986), in *Economic Record*, **63**: 366–368, December, 1987.
- [20] Marks, R.E. (1987) "On redesigning an academic journal," *Australian Journal of Management*, **12**(2): 149–158, (December).
- [21] Marks, R.E. (1986) "Energy issues and policies in Australia," *Annual Review of Energy and the Environment*, **11**: 47–75.

- [22] Marks, R.E., P. Watt, and P. Yetton (1981) "GMAT scores and performance: selecting students into a graduate management school," *Australian Journal of Management*, **6**(2): 81–102, (December).
- [23] Marks, R.E. (1980) "The value of 'almost' perfect weather information to the Australian tertiary sector," *Australian Journal of Management*, **5**(1&2): 67–86, (October).
- [24] Marks, R.E. (1974) "The heroin problem: policy alternatives in dealing with heroin use," *Journal of Drug Issues*, **4**(1): 69–91, (Winter).

3.2 B: Refereed Published Conference Papers

- [25] Kong X., Marks R.E., and Wan G.H. (1999), "Efficiency and its determinants of Chinese state-owned enterprises," in Zhou Z.-Y., Chudleigh J., Wan G.-H., and MacAuley G. (editors), *The Chinese Economy Towards the 21st Century*, Proceedings of the Tenth Annual Conference of the Association of Australian Chinese Economic Studies, Orange, 12 July 1998, (Orange, N.S.W.: Orange Agricultural College and Department of Agricultural Economics, University of Sydney). ISBN: 1864870176 (30%)
- [26] Marks, R.E., Midgley, D.F., Cooper, L.G. and Shiraz, G.M. (1999), "Coevolution with the Genetic Algorithm: application to repeated differentiated oligopolies," In Banzhaf, W., Daida, J., Eiben, A.E., Garzon, M.H., Honavar, V., Jakiela, M., & Smith, R.E. (eds.). *GECCO-99: Proceedings of the Genetic and Evolutionary Computation Conference*, July 13-17, 1999, Orlando, Florida USA. (San Francisco, CA: Morgan Kaufmann). pp. 1609–1615. ISBN 1 55860 611 4 (55%)
I was also a member of the program committee for this international conference, which is the leading international conference in Genetic Algorithms. I first presented at its forerunner in 1989, see [35].
- [27] Marks, R.E., Midgley, D.F., Cooper, L.G. and Shiraz, G.M. (1998), "The complexity of competitive marketing strategies," in *Complex Systems '98: Complexity Between the Ecos: From Ecology to Economics*, Proceedings of the Fourth Conference on Complex Systems, UNSW, November–December 1998, edited by R. Standish, B. Henry, S. Watt, R. Marks, R. Stocker, D. Green, S. Keen, and T. Bossomaier, (Sydney: Conference Committee), 1998, pp.336–345. ISBN 0 7334 0537 1 (55%)
I was also a member of the organising committee for this conference.
- [28] Shiraz, G.M., Marks, R.E., Midgley, D.F., and Cooper, L.G. (1998), "Using Genetic Algorithms to breed competitive strategies in marketing," in the Proceedings of the 1998 IEEE International Conference on Systems, Man, and Cybernetics, La Jolla, California, USA, October 11–14, 1998: *Intelligent Systems for Humans in a Cyberworld*. (New York: IEEE), pp. 2367–2372. ISBN: 0-7803-4778-1 (50%)
- [29] Marks, R.E. (1996) "Evolved perception and behaviour in oligopolies," in *Commerce, Complexity and Evolution Program and Papers*, Volume Two, Tuesday February 13th, ed. by S. Keen, C. Chiarella, R. Marks, and H. Schnabl, (Sydney: Conference Organising Committee). (AGSM Working

Paper 96–032, September 1996)

Earlier papers were noted in the previous promotion document.

- [30] Marks, R.E. (1992) “Finding the middle ground: the use of market incentives to protect the environment,” in *Enviromine Australia Proceedings: Conference at Taronga Zoo, March 13–22, 1992*, Volume 3, Abstracts and Supplementary Papers, ed. by J.E. Epps, D.P. Woodside, and D.R. O’Neill, (Sydney: The Australasian Institute of Mining and Metallurgy; The Zoological Parks Board of New South Wales).
- [31] Marks, R.E. (1992) “Costs of illegal drug use,” in *The Consequences of Alcohol and Drug Use: Proceedings of the Fifth National Drug and Alcohol Research Centre Annual Symposium, Melbourne, March, 1992*, held as part of the Third International Conference on the Reduction of Drug-Related Harm, ed. by W. Swift, (Sydney: National Drug and Alcohol Research Centre, Monograph No. 15), pp. 18–31.
Dr. Marks was co-convenor and chair of the the National Drug and Alcohol Research Centre Annual Symposium on “Measuring the Economic Consequences of Drug and Alcohol Use: Implications for Policy.”
- [32] Marks, R.E. (1991) “Australian energy policy and conservation,” in *Energy Systems, Management and Economics: Selected Papers from the IFAC/IFORS/IAEE Symposium*, cosponsored by the International Federation of Automatic Control, the International Federation of Operational Research Societies, and the International Association for Energy Economics, Tokyo, 25–27 October 1989, IFAC Symposia Series, 1990. No. 14, ed. by Y. Nishikawa, Y. Kaya, and K. Yamaji, (Oxford: Pergamon Press for the IFAC), pp. 409–415.
- [33] Marks, R.E. and P.L. Swan (1990) “Abatement: global action, Australian road transport, and macroeconomic costs,” in *Greenhouse and Energy*, ed. by D.J. Swaine, (Melbourne: CSIRO Australia), pp. 107–118.
- [34] Marks, R.E. (1990) “Relaxing the prohibition: effects on supply and demand,” in *Controlled Availability: Wisdom or Disaster?* ed. by J. Hando and J. Carless, (Sydney: National Drug and Alcohol Research Centre, Monograph No. 10), pp. 11–16.
- [35] Marks, R.E. (1989) “Breeding hybrid strategies: optimal behavior for oligopolists,” *Proceedings of the Third International Conference on Genetic Algorithms*, George Mason University, June 4–7, 1989, ed. by J. David Schaffer, (San Mateo, Calif.: Morgan Kaufmann Publishers), pp.198–207.
Professor James D. Laing of the Wharton School, Department of Operations and Information Management, uses this paper as required reading in the course, OPIM 319: *Seminar in Advanced Decision Systems: Evolutionary Computation*, (Spring 1996), Section 11, Applying evolutionary computation to economic theory. (See <http://opim.wharton.upenn.edu/dworman/opim319/ds319s96.html>)

- [36] Marks, R.E. and P.L. Swan (1987) "Property rights and implicit discount rates in the world oil market," in: *The Changing World Energy Economy: Papers and Proceedings of the Eighth Annual North American Conference, November 10-21, 1986*, edited by D.O. Wood, (Cambridge, Mass.: International Association for Energy Economics), pp.525-530.
- [37] Marks, R.E. (1980) "The value of perfect weather information to the Australian tertiary sector," in: *Proceedings of the Conference on Value of Meteorological Services, Melbourne, 21-23 February 1979*, (Melbourne: Royal Meteorological Society/Economic Society of Australia and New Zealand/Australian Agricultural Economics Society), pp.129-147.

3.3 C: Books — both authored and edited

- [38] Barnett W.A., Chiarella C., Keen S., Marks R.E., and Schnabl H., (editors), (2000), *Commerce, Complexity and Evolution: Topics in Economics, Finance, Marketing and Management: Proceedings of the Twelfth International Symposium in Economic Theory and Econometrics*, ed. by W.A. Barnett, Cambridge: Cambridge University Press, xxvii + 394 p. ISBN 0-521-620309 (In the series: International Symposia in Economic Theory and Econometrics.) (My share of editing and reviewing: 25%.)

The editors of this volume are employed at universities in the U.S., Germany, and Australia. Contributors to this volume are employed at universities in Belgium, Japan, Germany, the U.S., the U.K., and Australia. Since the volume was published only at the end of August, 2000, it is premature to find many reviews of it. The following description (from a site in Japan) will suffice:

"A significant contribution to the new paradigm — straddling economics, finance, marketing, and management — which acknowledges that commercial systems are evolutionary, and must therefore be analysed using evolutionary tools. Evolutionary systems display complicated behaviours which are often generated endogenously, rather than being solely the product of exogenous shocks, hence the conjunction of complexity with evolution. This volume considers a wide range of systems, from the entire economy, to the behaviour of single markets. Topics include: debt-deflation, stock management, interactions between consumers, and nonlinear methods to profit from financial market volatility."

<<http://www.midori-book.co.jp/str001/str001001/003/H6001971.htm>>

- [39] R. Standish, B. Henry, S. Watt, R. Marks, R. Stocker, D. Green, S. Keen, and T. Bossomaier (editors), (1998), *Complex Systems '98: Complexity Between the Ecos: From Ecology to Economics*, proceedings of the Fourth Conference on Complex Systems, UNSW, November-December 1998, Sydney: Conference Committee, vi + 393 p. ISBN 0 7334 0537 1 (My share of editing and reviewing: 10%.)
- [40] Keen, S., Chiarella, C., Marks, R.E., and Schnabl, H., (editors), (1996), *Commerce, Complexity and Evolution Program and Papers*, Sydney: Conference Organising Committee. ISBN 0-646-27524-0 (My share of

editing and reviewing: 30%.)

Earlier books were noted in the previous promotion document.

- [41] Marks, R.E. and P.L. Swan (1988) (editors), *Is the Australian Labour Market Ripe for Deregulation?* the Malcolm Fisher Festschrift, published as a special edition of the *Australian Journal of Management*, **13**(2): 137–274, (December). ISSN: 0312-8962
- [42] Marks, R.E. (1979) *Non-Renewable Resources and Disequilibrium Macrodynamics*, New York: Garland Publishing, xii, 335 p. ISBN: 0-8240-4053-8

3.4 D: Chapters in Books

- [43] Marks R.E. (2001) “Playing games with Genetic Algorithms,” *Evolutionary Computation in Economics and Finance*, ed. by Shu-Heng Chen, (New York: Springer-Verlag), forthcoming. (*invited*)
I was invited to write a survey chapter on the use of machine learning in applications of game theory, specifically oligopolistic behaviour, by Professor Chen of the National Chengchi University of Taiwan because of my pioneering work in this area in the late 'eighties and early 'nineties.
- [44] Kong X., Marks R.E., and Wan G.H. (2000) “Productivity performance of Chinese state-owned enterprises in the early 1990s — a stochastic production frontier and Malmquist Productivity Index analysis,” in Lloyd P.J. and X.-G. Zhang (editors), *China in the Global Economy*, (London: Edward Elgar), pp. 65–85. (30%)
This is one of several published papers written with my then PhD student, Dr. Xiang Kong.
- [45] Marks, R.E. (2000) “Evolved perception and the validation of simulation models,” in Barnett W.A., Chiarella C., Keen S., Marks R.E., and Schnabl H., (editors), *Commerce, Complexity and Evolution: Topics in Economics, Finance, Marketing and Management: Proceedings of the Twelfth International Symposium in Economic Theory and Econometrics*, Cambridge: Cambridge University Press, pp. 335–350.
Given the nature of this line of research — computer simulations using techniques from machine learning applied to oligopolistic behaviour, instead of closed-solution, analytical methods yielding necessary conditions as well as sufficient conditions — publication as book chapters or Conference papers is more accessible than in tier-1 or tier-2 journals.
- [46] Marks R.E. (2000) “Costs of change,” in Russell Fox, *Justice in the Twenty-First Century*, (London: Cavendish Publishing), pp. 227–235. (*invited*)
The Honorable Russell Fox had previously invited me to write a chapter on the economics of drug policy [37] and then invited me to write an economist's gloss on his proposals to reduce the costs associated with the criminal justice system.

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- [47] Marks, R.E. (1999) "The triumph of the firm," *New Directions in Corporate Strategy*, ed. by G. Twite and M. O'Keeffe, (Sydney: Allen & Unwin), pp. 39–46. (*invited*)
- [48] Marks R.E., and Schnabl H. (1999) "Genetic Algorithms and Neural Networks: a comparison based on the Repeated Prisoner's Dilemma," Thomas Brenner (ed.), *Computational Techniques for Modelling Learning in Economics*, in the series *Advances in Computational Economics* 11, (Dordrecht: Kluwer Academic Publishers), pp. 197–219. (*invited*) (50%)
I was invited as a distinguished guest to a workshop at the Max Planck Institute for Research into Economic Systems, Jena, Germany. This chapter on modelling learning in economics followed.
- [49] Marks R.E., Midgley D.F., and Cooper L.G. (1995) "Adaptive behavior in an oligopoly," *Evolutionary Algorithms in Management Applications*, ed. by J. Biethahn and V. Nissen, (Berlin: Springer-Verlag), pp.225–239. (60%)

Earlier chapters were noted in the previous promotion document.

- [50] Marks, R.E. (1992) "Costs of the prohibitions," in *Drugs Policy — Fact, Fiction and the Future*, ed. by Russell Fox and Ian R. Mathews (Sydney: The Federation Press), pp.118–133. (*invited*)
- [51] Marks, R.E. (1992) "Repeated games and finite automata," in *Recent Developments in Game Theory*, ed. by J. Creedy, J. Eichberger, and J. Borland (London: Edward Elgar), pp.43–64. (*invited*)

3.5 E: Other Published Work — Relevant

- [52] Marks R.E. (2001) "Another door opens," *Australian Journal of Management*, **26**(1): i–v. (editorial)
See Section 6.2 for a summary of my work as General Editor.
- [53] Marks R.E. (2000) "Globalisation is at risk," *Australian Journal of Management*, **25**(3): i–v. (editorial)
- [54] Marks R.E., Midgley D.F., and Cooper L.G. (2000) "Searching for Markov Perfect equilibria in oligopolistic price wars," The Industry Economics Conference, Sydney, (July 10–11), (Sydney: Conference Proceedings CD-ROM), and (Paris: INSEAD Working Paper 2000/65/MKT). (65%)
- [55] Marks R.E. (2000) "New products, new firms, and prices," *Australian Journal of Management*, **25**(1): i–v. (editorial)
- [56] Barnett W.A., Chiarella C., Keen S., Marks R.E., and Schnabl H., (2000), "Volume editors' preface," in Barnett W.A., Chiarella C., Keen S., Marks R.E., and Schnabl H., (eds.), *Commerce, Complexity and Evolution: Topics in Economics, Finance, Marketing and Management: Proceedings of the Twelfth International Symposium in Economic Theory and Econometrics*, ed. by W.A. Barnett, (Cambridge: Cambridge University Press), pp. xiii–xx. (25%)
- [57] Marks R.E. (1999) "Prices, options, and capacity," *Australian Journal of Management*, **24**(2): i–iii. (editorial)

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- [58] Marks R.E. (1999) "Globalisation, competition, and financial instruments," *Australian Journal of Management*, **24**(1): i–v. (editorial)
- [59] Marks R.E. (1998) "In search of efficiency," *Australian Journal of Management*, **23**(2): i–iv. (editorial)
- [60] Marks R.E. (1998) "Prices and values," *Australian Journal of Management*, **23**(1): i–iv. (editorial)
- [61] Marks R.E. (1997) "Risk and information—timely topics," *Australian Journal of Management*, **22**(2): i–iii. (editorial)
- [62] Marks R.E. (1997) "Deaths by drug policies: John Howard's more-of-the-same illicit drug policy will produce more drug deaths," *Australian Financial Review*, November 6, p.19.
- [63] Marks, R.E. (1994) "Energy policy research at Stanford University", in *ERDIC Annual Report 1993*, (Sydney: Energy Research Development and Information Centre, UNSW) pp. 39–43.

Earlier publications were noted in the previous promotion document.

- [64] Marks, R.E. (1993) "The law of supply and demand," *Cannabis and Narcotics: Problems and Prospects for Decriminalisation*, Proceedings of a Conference on Drug Law Reform under the ægis of The Law Society of New South Wales, October 23, 1993. (Sydney: The Law Society of N.S.W.).
- [65] Marks, R.E. (1993) "Coffee price wars and the Genetic Algorithm: estimating strategies in a real-world oligopoly," (with Lee Cooper and D.F. Midgley), *Emergent Structures*, (A newsletter of the Economics Research Program at the Santa Fe Institute), July 1993, pp.7–8.
- [66] Marks, R.E. (1991) "Rejoinder," [to "The risks and costs of decriminalising drugs: a response to Robert Marks," by David Hawks, *Policy*, **7**(2): 25–27, Winter], *Policy*, **7**(2): 27–28, Winter.
- [67] Marks, R.E. (1991) "The case for a regulated drugs market," *Policy*, **7**(1): 28–33, (Autumn).
- [68] Marks, R.E. (1990) "Carbon taxes and road transport," in *Vehicles: Energy and Environmental Impacts*, Proceedings of the Seminar held on October 10, 1990, (Sydney: Energy Research, Development and Information Centre, University of New South Wales), (November).
- [69] Marks, R.E. (1990) "Testimony before the Senate Standing Committee on Industry, Science and Technology's reference on *Reducing the Impact of the Greenhouse Effect*," *Official Hansard Report*, pp. 818–982, Canberra (June 26).
- [70] Marks, R.E. (1989) "Proposals for reducing carbon dioxide emissions produced by Australian energy use," Briefing Paper on Individualism and Collectivism: How Will Sustainability Affect the Roles of the Public and Private Sectors? in *Sustainable Policies and Making Them Work*, A National Two-Day Conference, UNSW (9–10 November)

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- [71] Marks, R.E., P.L. Swan, P. McLennan, R. Schodde, P.B. Dixon and D.T. Johnson, (1989) *The Economic Consequences for Australia of the Adoption of the Toronto Proposal for Carbon Dioxide Emissions*, (Melbourne: CRA Ltd.), (September).
- [72] Marks, R.E. (1989) "Heroin: the case for legalisation," *Australian Medicine*, **1**(7): 164, June 5.
- [73] Marks, R.E. (1989) "Testimony before the Parliamentary Joint Committee on the National Crime Authority's inquiry on *Drugs, Crime and Society*," *Official Hansard Report*, pp. 1,076–1,133, Canberra (March 16).
- [74] Marks, R.E. and P.L. Swan (1988) Introduction to the Malcolm Fisher Festschrift: *Is the Australian Labour Market Ripe for Deregulation?* published in a special edition of *Australian Journal of Management*, **13**(2): 137–139, (December).
- [75] Marks, R.E. (1986) "World population and the ratio of the living and the dead," *Verbatim* **13**(2): 9, Fall.
- [76] Marks, R.E. (1985) "Discussion" [at the conclusion of the Institute of Criminology seminar, "Drugs and Crime," held on 26 June 1985, Sydney], *Proceedings of the Institute of Criminology*, **65**: 64–66, 1985.

3.6 H: Other Reports

- [77] Harding R., Eckstein D., with Ashbolt N., Erskine W., Fox M., Johnson G., Marks R., Moore S., and Waite D., (1996) "Development of Composite Indices for State of Environment Reporting in NSW," Institute of Environmental Studies, UNSW, Sydney, for the NSW Environmental Protection Authority. (10%)
- [78] Marks, R.E. (1995) "Closed tender vs. open bidding auctions," Administrative Appeals Tribunal, Sydney.

Earlier reports were noted in the previous promotion document.

- [79] Marks, R.E., and F. Reay (1988) "Notes on *AJM* Style," mimeo., AGSM.
- [80] Marks, R.E. (1987) "Report on the Environmental Economic Effects of the Proposed Wyan Quarry Development at Possum Brush, NSW," Environmental Defender's Office, Sydney.
- [81] Louviere, J.J., R.E. Marks, and R. Mitchell (1980) "Forecasting long-term contingencies in the demand for railway services," Implementation & Management Group Pty. Ltd., Sydney, for the Australian Railway Research and Development Organisation, Melbourne.
- [82] Marks, R.E. (1978) "Non-renewable resources and disequilibrium macrodynamics," Department of Engineering-Economic Systems Student Thesis Series, Stanford, (February).

3.7 I.1: Working Papers Not Elsewhere Published

- [83] Lawrance A.B., and Marks R.E. (2000) "Duration analysis in the Australian coal industry," AGSM Working Paper 00-008 (April). (30%)
Mr. Lawrance is a Ph.D. student of mine. This work brings together my interests on energy economics and evolution of industries.
- [84] Kong X., Marks R.E. (1999) "Enterprise institutional reform and productive performance in Chinese state-owned enterprises 1990–1994," AGSM Working Paper 99–003 (April). (30%)
- [85] Marks R.E., Midgley D.F., Cooper L.G. (1998) "Refining the breeding of hybrid strategies," AGSM Working Paper 98–017 (December). (60%)
- [86] Drake A.E. and Marks R.E. (1998) "Genetic algorithms in economics and finance: forecasting stock market prices and foreign exchange — a review," AGSM Working Paper 98-004 (February). (45%)
- [87] Marks R.E. (1998) "Competition and common property," AGSM Working Paper 98-003 (February).
- [88] Midgley D.F., Marks R.E., and Cooper L.G. (1994) "Breeding competitive strategies", University of California at Los Angeles, Anderson Graduate School of Management Working Paper No. 242 and AGSM Working Paper 95-001 and Santa Fe Institute Working Paper 95-06-052. (Revised, August, 1995.) (Accepted for presentation at the Seventh World Congress of the Econometric Society, Tokyo, August 1995.) (55%)
My late wife's illness meant that I could not attend.

Earlier papers were noted in the earlier promotion document.

- [89] Marks, R.E., P.L. Swan, P. McLennan, R. Schodde (1989) "The feasibility and implications for Australia of the adoption of the Toronto Proposal for carbon dioxide emissions," AGSM Working Paper 89-032 (November).
- [90] Marks, R.E. (1989) "Niche strategies: the Prisoner's Dilemma computer tournaments revisited," presented at the 1988 Australian Economics Congress under the auspices of the Econometric Society, Canberra (August–September), and AGSM Working Paper 89-009 (April). (provisionally accepted for publication by *Computational Economics*.)
- [91] Marks, R.E. (1987) "Wages and discrimination with incomplete information," presented at the Fourth Analytical Economists' Workshop, Canberra, (February), and the 1986 Australasian Meeting of the Econometric Society, Melbourne, (August), AGSM Working Paper 87–028 (October).
- [92] Marks, R.E. and R. Ball (1986) "Short-term supply side instability in the oil market," presented at the Fifteenth Conference of Economists, Melbourne, AGSM Working Paper 86–023 (September).
- [93] Marks, R.E. (1983) "Energy, output, and employment in the short run," presented at the 1979 Econometric Society Meetings, Atlanta, AGSM Working Paper 83–030 (October).

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- [94] Marks, R.E. and J.L. Sweeney (1983) "Expectations and the Hotelling Rule," presented at the 1983 Australasian Meeting of the Econometric Society, Canberra, and AGSM Working Paper 83-005 (February).
- [95] Marks, R.E. and J.L. Sweeney (1980) "The competitive pricing of non-renewable natural resources," presented at the 1979 Western Economic Association Meetings, Las Vegas, *Energy Modeling Forum Occasional Paper OP 8.1*, Stanford University, (July).
- [96] Marks, R.E. (1970) *Surface Fitting for Coons' Patches*, C.A.D. Group Document No. 46, Computer-Aided Design Group, University Computer Laboratory, Cambridge University, (October).

3.8 I.2: Published Audio-Visual Works

- [97] Marks, R.E. (1993) *Doing Economics with Computers*, an EES Silver Symposium Series Videotape, (Stanford: Engineering-Economic Systems, Stanford University, April).
- [98] Marks, R.E. (1993) *Coffee Price Wars and the Genetic Algorithm: Estimating Strategies in a Real-World Oligopoly*, a Santa Fe Institute Colloquium Videotape, (Santa Fe, N.M.: SFI), (February 26).
- [99] Marks, R.E. (1991) *Good Decisions, Better Outcomes—Taking the Uncertainty out of Decision-Making*, in *The Emerging Manager—Responding to the Challenge of Change*, An Audio Cassette Series for New Managers, (Sydney: The National Training Division of The International, Professional, and Continuing Education Institute, UNSW), (May).

3.9 I.3: Published Instructional Materials

- [100] Owen, A.D., and Marks, R.E. (1996) "Australian energy markets," *Energy Management*, ed. by G.D. Sergeant, (Sydney: UNSW Graduate School of Engineering), Unit 3. (50%)

3.10 I.4: On-Line Web Pages

- [101] The AGSM Economics Cluster Web Pages, <<http://www.agsm.edu.au/~bobm/Economics.html>>
This first appeared on the Web in 1996, the first academic Web site published by the AGSM. It continues to evolve.

3.11 I.5: Invited Unpublished Papers and Public Presentations

- [102] 2000 "Efficient, competitive, and informed markets: Australian Corporations Law and auctions," presented at the School of Economics, UNSW, (May 19), (*invited*).
- [103] 1999 "Criteria for comparative policy analysis in research and practice," presented as a Roundtable Participant at the Twenty-First Annual Association for Public Policy Analysis and Management Research

Conference, Washington DC, (November). (*invited*)

- [104] 1999 “Refining the breeding of hybrid strategies: repeated games in the coffee market,” (with D. Midgley and L. Cooper) presented at the Computational Modeling Workshop, U.C.L.A. Anderson School & Division of Social Science, Los Angeles, (March). (*invited*) (55%)
- [105] 1998 “Validation of simulation models,” accepted for presentation at the workshop on ACE (Agent-based Computational Economics): Experimental Design and Data Analysis, for the International Federation of Automatic Control/Society for Computational Economics/International Federation for Information Processing/International Federation of Operational Research Societies Symposium on Computation in Economics, Finance, and Engineering: Economic Systems, Cambridge, UK, (June 29 – July 1) (*invited*)
My late wife’s illness meant that I could not attend.
- [106] 1998 “Genetic algorithms and neural networks: a comparison based on the repeated Prisoner’s Dilemma,” (with Hermann Schnabl), presented at the workshop, Agent-Based and Population-Based Modelling of Learning in Economics, Max Planck Institute for Research into Economic Systems, Jena, (March 2–3). (*invited*) (50%)
- [107] 1997 “Electronic publishing: a practitioner’s view,” presented at the UNSW Copyright Forum, Sydney, (July 10) (*invited*)
<<http://www.agsm.unsw.edu.au/~bobm/copyright.html>>
- [108] 1995 “How boundedly rational are brand managers?” (with David Midgley and Lee Cooper), presented at the the Santa Fe Insititute’s Workshop on Artificial Economies (May) (*invited*), and the 1995 INFORM Marketing Science Conference, University of New South Wales, (4 July). (60%)

Earlier papers were noted in the previous promotion document.

- [109] 1993 “Doing economics with computers,” presented at the Engineering-Economic Systems Silver Symposium Series, Stanford University, (March 25). (*invited*)
- [110] 1993 “Coffee price wars and the Genetic Algorithm: estimating strategies in a real-world oligopoly,” (with Lee Cooper and David Midgley), presented in the Santa Fe Institute Colloquium Series, (February 26). (*invited*)
- [111] 1992 “Benchmarking oligopolistic behavior: repeated games in the coffee market,” presented at the Engineering-Economic Systems Department, Stanford University (November 10). (*invited*)
- [112] 1992 “Costs of illegal drug use,” at The National Drug and Alcohol Research Centre Annual Symposium on “Measuring the Economic Consequences of Drug and Alcohol Use: Implications for Policy,” at *The Third International Conference on the Reduction of Drug-Related Harm*, Melbourne (23–26 March) (*invited*).

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- [113] 1991 "The costs of drug law enforcement," presented at the Papua New Guinea Foundation for Law, Order, and Justice's international conference on *Drug-Related Crime in Papua New Guinea*, Lae (May 13–17) (Invited by Mr. Ken Egan, Director of the Foundation for Law, Order, and Justice, at the suggestion of Professor Duncan Chappell, director of the Australian Institute of Criminology, Canberra). (*invited*)
- [114] 1991 "Finding the middle ground: markets and conservation," presented at the Department of Management, University of Western Australia, Perth (17 April) (*invited*).
- [115] 1991 "Air-polluting behaviour in Australia: instruments for change," presented at *Market-Based Environmental Policy*, a conference hosted by the School of Economics, University of New South Wales, Sydney (20 March) (*invited*)
- [116] 1990 "Economic commentary," presented at An Intensive One-Day Briefing for Senior Decision-Makers on *Environmental Strategy: New Economic Policies and Regulatory Schemes*, Sydney and Melbourne (15, 29 October), (Sydney: Calcutt Watson and Associates Pty. Ltd., 1990) (*invited*)
- [117] 1990 "Carbon taxes and road transport," presented at the Energy Research Development and Information Centre's seminar on *Vehicles: Energy and Environmental Impacts*, co-sponsored by the NSW Department of Minerals and Energy and the AGL Gas Companies, University of New South Wales (10 October) (*invited*).
- [118] 1990 "Repeated games and finite automata," presented at the Two-Day Seminar on Recent Developments on Game Theory, University of Melbourne (7–8 June) (*invited*).
- [119] 1990 "Relaxing the prohibition of heroin: effects on supply and demand," presented at the Fifth International Conference on Treatment of Addictive Behaviours, Sydney (4–9 February) (*invited*).
- [120] 1989 "Economics of drug policies," presented at Drugs, the Law, and Medicine, a summit cosponsored by the Australian Doctors' Fund and the Australian Medical Association, Sydney (17–18 November) (Invited by Dr. Bruce Shepherd, then President of the Australian Medical Association.) (*invited*)
- [121] 1989 "Prohibition or regulation: an economist's view of Australian heroin policy," presented at the Fifth Annual Conference of the Australian & New Zealand Society of Criminology, Sydney (July) (*invited*).
- [122] 1974 "Decision-making under uncertainty," Distinguished Visitor, Sixth Winter Management Seminar, University of Melbourne Business School Association (August 27). (*invited*)

4. Submissions, Unpublished Papers, and Other Public Presentations

- [123] 2001 Lawrance A.B., and Marks R.E., "Duration analysis in an extractive industry," revised and resubmitted to the *Journal of Industrial Economics*. (30%)

Mr. Lawrance is a Ph.D. student of mine.

- [124] 2001 Marks R.E., "Direct and derived policies: illicit drug use and greenhouse gas emissions in Australia," submitted to the *Journal of Comparative Policy Analysis: Research and Practice (invited)*.
- [125] 2001 Marks R.E., Midgley D.F., Cooper L.G., "Breeding better strategies in oligopolistic price wars," submitted to the *IEEE Transactions on Evolutionary Computation*. (60%)
- [126] 2001 Kong X., Marks R.E., and Wan G.H., "Productive performance of Chinese state-owned enterprises in the early 1990s", submitted to the *China Economic Review*. (30%)
- [127] 1997 "Refining the breeding of hybrid strategies," (with David Midgley and Lee Cooper), presented at the Third International Conference on Computing in Economics and Finance, Stanford, (June 30–July 2) (55%)
- [128] 1996 "Optimal partitioning: evolved perception and behaviour in oligopolies," presented at the Second International Conference on Computing in Economics and Finance, University of Geneva, (26 June).

Earlier presentations and papers were noted in the previous promotion document.

- [129] 1994 "Adaptive behaviour in an oligopoly," (with Lee Cooper and David Midgley), presented at the Australasian Meetings of the Econometric Society, University of New England, July, and the 15th Annual Conference of the Society for Economic Dynamics and Control, under the auspices of the Society for Computational Economics, Nafplion, Greece, June 25, 1993.
- [130] 1993 "Breeding optimal strategies for multiple-period competitive games in mature markets," (with Lee Cooper and D.F. Midgley), presented at The 1993 T.I.M.S. Marketing Science Conference, Washington University, (13 March).
- [131] 1991 "Costly complexity of strategies in repeated games," presented at the 1991 Australasian Meetings of the Econometric Society, University of New South Wales, Sydney (10–13 July)
- [132] 1990 "Measures of strategic complexity," presented at the Sixth World Congress of the Econometric Society, Barcelona (22–28 August).
- [133] 1981 "Macro-economic effects of the import parity pricing of oil," presented at the Tenth Conference of Economists, Canberra, (August).

5. Other Research-Related Activities

5.1 Other Research-Related Activities — Overseas Invitations

Dr. Marks has been invited to make presentations at the following recent overseas conferences:

Roundtable Participant at the Twenty-First Annual Association for Public Policy Analysis and Management Research Conference, Washington DC, 1999, on “Criteria for Comparative Policy Analysis in Research and Practice.”

Computational Modeling Workshop, U.C.L.A. Anderson School & Division of Social Science, Los Angeles, 1999. (This was an all-expenses-paid presentation.)

The Workshop on Agent-Based and Population-Based Modelling of Learning in Economics, Max Planck Institute for Research into Economic Systems, Jena, Germany, 1998.

The Second International Conference on Computing in Economics and Finance, Geneva, 1996.

The Santa Fe Institute Workshop on Artificial Economies, Santa Fe, New Mexico, 1995.

Dr. Marks has presented invited papers at the following overseas institutions and universities:

Arizona State University, Decision Focus Inc., Los Altos, California, George Mason University, Massachusetts Institute of Technology, The Max Planck Institute, Jena, Stanford University, The Santa Fe Institute, University of California at Berkeley, University of California at Los Angeles, University of Cambridge, University of Geneva, University of Rochester, University of Utah, Washington University.

5.2 Other Research-Related Activities — Higher Degree Supervision and Examination

Supervisor, Successful Doctoral Candidates:

Xiang Kong: *China's Industrial Reform and the Productive Performance of State-Owned Enterprises*, 2000.

Dr. Kong is currently a Research Officer at the Shenzhen Stock Exchange in China.

Boon Chye Lee: *The Economics of International Debt Renegotiation: The Rôle of Bargaining and Information*, 1990. Published as a book by Westview Press (Boulder, San Francisco, and Oxford), 1993.

On graduation, Dr. Lee was appointed Lecturer in Economics at the University of Wollongong, where he is now a tenured Senior Lecturer.

Jeffrey James Bateson: *An Economic Analysis of Electricity Supply in New South Wales: Prospects for Competition*, 1989 (co-supervisor).

Since graduation, Dr. Bateson has held positions with the NSW Treasury (chief economist and director of its commercial sector division), County NatWest Corporate Finance, Sydney (associate director), CLP Power Hong Kong Ltd. (G.M., strategy and development), and currently Innogy Holdings

plc U.K. (finance and planning director).

Supervisor, Continuing Doctoral Candidates:

Dr. Marks is supervisor of Mr. Anthony Lawrance (to submit before the end of 2001); and Mr. Scott Muller.

Dr. Marks has acted as an examiner for the following institutions:

Australian National University (Ph.D. on the economics of organisations and management).

University of Melbourne (Ph.D. on energy policy);

University of Stuttgart (Abteilung für Privatrecht on use of genetic algorithms in economics and finance);

University of Wollongong (Honours thesis on drug policy).

5.3 Other Research-Related Activities — Editorial Boards

General Editor, *The Australian Journal of Management*, (since 1997), and previously Area Editor in Economics (1984–1997).

As General Editor, Dr. Marks has appointed five of the eight Area Editors: Professor John Lyon (AGSM) in Accounting; Professor Joshua Gans (MBS) in Economics; Professor Graham Pervan (Curtin University) in IT; Professor Mark Uncles (UNSW) in Marketing; and Associate Professor Sharon Parker (AGSM) in OB. Dr. Marks has negotiated special issues on Marketing, on OB, on Government Growth Policy, and on Mergers and Acquisitions, as well as overseeing the regular biannual issues. The 1995 grant from the AVCC was used to put the *Journal* on-line, at <<http://www.agsm.edu.au/eajm>>.

Foundation editorial board member, *Journal of Comparative Policy Analysis: Theory and Practice* (U.K.) (since 1997).

Associate Editor, *IEEE Transactions on Evolutionary Computation*, special issue on Agent-Based Modeling of Evolutionary Economic Systems (U.S.A.).

5.4 Other Research-Related Activities — Reviewer

Dr. Marks has acted as a reviewer for the following journals:

Australian Journal of Management, *Journal of Industrial Relations*, *Journal of Environmental Economics and Management* (U.S.A.), *Economic Record*, *International Economic Review* (U.S.A.), *Australian Journal of Political Science*, *The Energy Journal* (U.S.A.), *Journal of Economic Studies* (U.K.), *Addiction* (U.K.), *Journal of Evolutionary Economics* (Germany), *Australian Quarterly*, *Complexity* (U.S.A.), *Journal of Economic Dynamics and Control* (U.K.), *Agenda*, *Journal of Economic Behavior and Organization* (Netherlands), *Australian Journal of Agricultural and Resource Economics*, *Computational Economics* (Netherlands).

Dr. Marks has acted as a reviewer for the following publishers:

Oxford University Press, Jacaranda Wiley, HarperEducation, Addison Wesley

Longman, and for *Advances in Evolutionary Computation*, (eds. A. Ghosh and S. Tsutsui, University of Illinois) to be published by Springer-Verlag, New York.

5.5 Other Research-Related Activities — Proposal Referee

Dr. Marks has acted as a referee for grants applied for from the following bodies: U.S. National Science Foundation, Division of Social, Behavioral, and Economic Research; Australian Research Council; National Health and Medical Research Council; Research into Drug Abuse Grants Program of the National Campaign Against Drug Abuse, Commonwealth Department of Community Services and Health.

5.6 Other Research-Related Activities — Conference Program Committees and Session Convener

Dr. Marks has been invited to act in these roles at the following recent conferences: Second International Workshop on Computational Intelligence in Economics and Finance, to be held as part of the Sixth Joint Conference on Information Science 2002; Genetic and Evolutionary Computation Conference 1999; Fourth Conference on Complex Systems 1998; The International Federation of Automatic Control/Society for Computational Economics/International Federation for Information Processing/International Federation of Operational Research Societies Symposium on Computation in Economics, Finance, and Engineering: Economic Systems 1998; IEEE International Conference of Evolutionary Computing 1995; Commerce, Complexity, and Evolution 1996; The Third International Conference on the Reduction of Drug-Related Harm 1992.

6. Professional Experience

6.1 Professional Experience — Research:

Dr. Marks has worked as a paid researcher for the following institutions: Division of Building Research, CSIRO; Urban Systems Laboratory, Massachusetts Institute of Technology; Computer-Aided Design Group, University Computer Laboratory, University of Cambridge; National Bureau of Economic Research – West, (Stanford).

6.2 Professional Experience — Advisor/Expert Witness:

Dr. Marks has acted as an advisor/expert witness to the following organisations: Australian Council of Trade Unions (on the Campbell Inquiry into Australian finance); Tasmanian Wilderness Society (on job generation and industry assistance); N.S.W. Land and Environment Court (on the economic appraisal of Environmental Impact Statements); Parliament of Australia, Joint

Committee on the National Crime Authority, Inquiry into Drugs, Crime and Society (on drug policy and macroeconomics); Parliament of Australia, Senate Standing Committee on Industry, Science and Technology, Inquiry into Reducing the Impact of the Greenhouse Effect (on the costs of reducing carbon dioxide emissions); for Australian Metals Holdings Pty. Ltd., before the Administrative Appeals Tribunal (on the Corporations Law and selling control using auctions).

6.3 Professional Experience — Consulting:

Dr. Marks has acted as a consultant to the following organisations:

Australian Railways Research and Development Organisation (on forecasting techniques); Decision Focus Incorporated (Los Altos, California) (on energy modelling); Environmental Defender's Office Ltd, (Sydney) (on valuing of environmental amenity); Bankstown City Council; CRA Ltd. (on the economics of global warming); Corporate ScoreCard Pty. Ltd. (on scoring multi-attribute economic risk); Unisearch, for the Department of Primary Industry and Energy, (Canberra) (on the economics of residential energy use); Unisearch, for the NSW Environmental Protection Authority (on developing indices for environmental quality); Unisearch, for Multiplex Constructions Pty. Ltd. (on "greening" the Olympic Stadium); Freehill Hollingdale & Page (Sydney), for Amalgamated Television Services Pty. Ltd. (the Seven Network) (on a Trade Practices matter); Freehill Hollingdale & Page (Sydney), for Austar Entertainment Pty. Ltd., STV Pty. Ltd., and CTV Pty. Ltd. (on a Trade Practices matter: the markets for television services); Mallesons Stephen Jacques; Phillips Fox (Sydney), for East Coast Pay Television Pty. Ltd. (on a Trade Practices matter: the markets for television services); Austar Entertainment Pty. Ltd. (on a submission to the Australian Consumer and Competition Commission on the declaration of prescription broadband television services); Centre for International Economics (Canberra and Sydney) for the N.S.W. Treasury (advising on auctions); Deacon's (Sydney), for Dymock's Booksellers (on the value of an on-line bookseller).

6.4 Professional Memberships:

Member, The Economic Society of Australia

Member, The American Economics Association

Member, The Econometric Society

Member, The Association of Environmental and Resource Economists

Member, The International Association for Energy Economics

7. Honours and Awards:

1964–1967 Australian Commonwealth Scholarship.

1965–1966 Major Residence Scholarship, Ormond College, University of Melbourne.

1968–1969 Australian Commonwealth Postgraduate Award.

1969–1973 Australian Commonwealth Scientific and Industrial Research Organisation Overseas Studentship,
Subject area: Engineering systems.

1972 Stanford University Representative, Tenth Annual UN Graduate Study Programme, Geneva.

1974–1975 Resources for the Future, Inc., Fellowship.

1978 Doctoral dissertation published as a monograph in both the *Garland Series of Outstanding Economics Dissertations* and the *Garland Series of Outstanding Energy Dissertations*.

1987 Winner of the Second Massachusetts Institute of Technology Competitive Strategy Tournament.

8. Teaching:

I had taught at Stanford University (EES 110 Microeconomics, 1976) before arriving at the new AGSM, where, as a foundation lecturer, I conceived, developed, and delivered all my courses.

Between 1977 and 1984, on the MBA/MPA Program, I designed and taught:

- AGSM 608 Economic Investment Appraisal
- AGSM 713 Management in Society
- AGSM 720 Public Finance
- AGSM 721 Economics of Natural Resources
- AGSM 722 Energy Economics and Management

Since 1985, on the full-time MBA Program, I have designed and taught:

- AGSM 200 Markets and Prices
- AGSM 202 Economic Investment Appraisal
- AGSM 204 Macroeconomics for Managers
- AGSM 206 Microeconomic Analysis
- AGSM 303 Taxes and Organizations
- AGSM 304 Resource Markets and Management
- AGSM 305 Energy Markets and Management
- AGSM 306 Strategic Game Theory for Managers
- AGSM 594 Systems, Strategy and Sustainability (jointly)
- AGSM Strategic and Economic Thinking (jointly)

On the Executive Program:

I was the Director of the three-day Executive Course on Resource Economics (1981–85).

Since 1997 I have been the foundation Director of the two-day Executive Program, “Thinking Strategically: Gaining the Competitive Edge in Business”.

I have taught this Program three times (latterly with the assistance of Dr Stonecash). It entails developing and delivering twenty hours of information, instruction, and insights over two days to a group (thirty to forty middle managers) of paying participants. The content builds on material I have developed for classes in the MBA Program.

Since 1997 I have been the foundation Co-Director of the two-day Executive Program, “Managerial Decision Making”.

Professor Robert Wood and I have taught this Program four times. It entails our developing and delivering twenty hours of information, instruction, and insights over two days to a group (around twenty middle managers) of paying participants. (50%) My content builds on material I have developed for classes in the MBA Program.

I have also taught on

the School of Science and Technology Studies, Master of Science and Society Program; the School of Community Medicine, Master of Community Health/Master of Public Health Program; the UNSW International Professional and Continuing Education Institute audiotape program; the Graduate School

of Engineering, Master of Business and Technology, GSOE.9109 Energy Management course; the Faculty of Engineering, Study Abroad Summer Program.

8.1 Recent Teaching Evaluations — Full-Time MBA Program

Year	Subject	No. of Students	% Approval for Lecturer	% Approval for Subject
1994	Microeconomic Analysis	47	53	67
1994	Strategic Game Theory for Managers	18	71	69
1994	Economic Investment Appraisal	10	85	58
1994	Macroeconomics for Managers	39	53	80
1995	Microeconomic Analysis	35	78	79
1995	Strategic Game Theory for Managers	21	75	96
1995	Economic Investment Appraisal	23	77	74
1996	Microeconomic Analysis	44	72	79
1996	Strategic Game Theory for Managers	30	74	93
1996	Economic Investment Appraisal	19	90	98
1997	Microeconomic Analysis	39	76	89
1997	Strategic Game Theory for Managers	22	69	84
1997	Economic Investment Appraisal	8	84	100
1998	Strategic Game Theory for Managers	31	65	95
1999	Economic Investment Appraisal	30	68	65
2000	Strategic and Economic Thinking	82	65	88
2000	Strategic Game Theory for Managers	24	75	88
2000	Economic Investment Appraisal	7	88	76
2000	Systems, Strategy & Sustainability *	2	na	na

* Co-taught with three others.

I note that since my late wife's death in late 1998, my evaluations, although rising, have not yet regained the levels of 1997.

8.2 Recent Teaching Evaluations — Executive Program

Program	Year	Number of days	Number of participants	Median Score		
				Content	Presentation	Relevance
Managerial Decision Making *	1997	2	15	1	1	1
	1998	2	18	2.5	2	2
	1999	2	15	3	2	3
	2000	2	21	2	2	2
Thinking Strategically	1997	2	38	2	3	2
	1999 **	2	29	2	1	1.3
	2000 **	2	29	2	2	2

* jointly with Professor Robert Wood ** jointly with Dr. Robin Stonecash

Scoring: Highest = 4, Lowest = -4.

See complete Teaching Evaluations for the courses Strategic Game Theory for Managers 2000, Economic Investment Appraisal 1996, and Microeconomic Analysis 1997 attached (Appendix 1).

8.3 Teaching Innovations

Over the past six years, I have attended annual seminars on teaching and learning at the AGSM from Visiting Professor Sean O Connor of Washington College, U.S.A. This has led to improvements in my confidence and skills for enhancing class-room learning.

Using on-line means to communicate with students: the Web site of the course allows me to share overheads, assignments, and guidelines; using email as a two-way communication channel for questions, answers, submissions, and announcements.

See <<http://www.agsm.edu.au/~bobm/teaching/SGTM.html>> for Strategic Game Theory for Managers 2001.

Using the AGSM StarLab computer laboratory to blend paper-and-pencil working with a software package for decision analysis — helping students balance the exercise of applying concepts in analysis and the exercise of managing the software.

In the future: using the Web for surveying students and having them complete questionnaires (using Javascript).

9. Institutional Rôles

9.1 Institutional Rôles — University

The main service to the University has been to serve as an elected member of the University Council for two years (1986–1988).

Other roles have been:

Appointed by Professor Michael Birt, Vice Chancellor, as a member of the Selection Committee for Appointment of a Pro-Vice-Chancellor, 1988. (We recommended Professor Alan Gilbert to the position.)

Academic staff nominee, Selection Committee for Appointment of a Dean, AGSM (1995–1997). (I attach testimonials from the Vice Chancellor, Professor John Niland, and from Ms Patricia Rochford in Appendix 2.)

Invited member, Management Committee of the Energy Research, Development and Information Centre (since 1989).

Academic Board nominee, Management Committee for the Institute of Environmental Studies (1992–1999).

Invited member, Advisory Committee of the Centre for Applied Economic Research (since 1995).

Invited member, Qualifications Committee, considering promotion to Associate Professor (2001).

9.2 Institutional Rôles — AGSM

The main service to the School was to serve for two terms as the staff-elected member of the AGSM's Board of Management (1989–1992).

Other significant positions have been:

The School's longest serving discipline head, of the Economics Cluster. (1985–1986, and since 1993.)

This is the AGSM equivalent of Head of School.

In this period, I have hired four members of permanent staff: Drs. K. Zauner, R. Bhattacharya, R. Stonecash, and C. Choe. (The last two are tenured Senior Lecturers in the AGSM.)

I have also hired twelve adjunct faculty to teach on the MBA programs (from UNSW, Sydney, Macquarie, La Trobe, and the Melbourne Business School).

I have established, on behalf of the Economics Cluster, two University prizes for economics performance in the full-time MBA program as memorials to, first, the late Emeritus Professor Malcolm Fisher, and, second, the late Professor Simon Domberger, both of whom were Professors of Economics at the AGSM.

I have overseen the School's Economics seminar series, with visitors

from UNSW, ANU, MIT, Sydney, Arizona, the Norwegian UST, Marseilles, Notre Dame (U.S.A.), Auckland, CUNY, Bielefeld, UBC, National Chengchi University in Taipei, Willamette, Melbourne, GIIIS in Geneva, La Trobe, the Catholic University of Leuven, Wisconsin/Madison, MBS.

Director of the AGSM MBA/MPA Program (1979–1980)

Economics Editor (1984–1997), and (since 1997) General Editor of the *Australian Journal of Management*.

(See the description of my performance in Section 5.3 above.)

10. Outreach

10.1 Outreach — Public Addresses and Broadcast Interviews:

These invitations fall into two categories: drug policy (33) and energy/environmental policy (15).

The most influential must be my appearance on *Four Corners*, on August 6, 1990, on energy and environmental policy. Other significant appearances are in front of Commonwealth Parliamentary committees (once on each topic), on Papua New Guinea radio, and on German radio.

10.2 Outreach — Mentions in the Popular Press:

These fall into three categories: competitive strategy and game theory (7), drug policy (31), and energy/environmental policy (27).

The most significant are mentions in editorials in the *Sydney Morning Herald* (May 9, 1989) and *The Independent Monthly* (February, 1994), both on the economics of drug policy.

11. Appendix 1 — Teaching Evaluations

1. Mngt 0202 Economic Investment Appraisal, 1996.
2. Mngt 0206 Microeconomic Analysis, 1997.
3. Mngt 0306 Strategic Game Theory for Managers, 2000.

12. Appendix 2 — Testimonials

1. Professor Milton Friedman, Nobel laureate, Hoover Institution.
2. Professor Robert Wilson, Stanford University.
3. Professor John Niland, Vice Chancellor, UNSW.
4. Ms Patricia Rochford, erstwhile University Councillor, Rochford Williams.
5. Dr. Alex Wodak, School of Medicine and School of Community Medicine UNSW and St. Vincent's Hospital, Sydney.
6. The Honourable Russell Fox, AC, QC, former Justice of the Federal Court of Australia.

Case for Promotion — Update

Update of Research Achievements.

I attach testimonials from Professor Kenneth Arrow (Nobel laureate in Economics, 1972), Dr David Fogel (editor-in-chief of both *BioSystems* and the *IEEE Transactions on Evolutionary Computation*), and Professor David Collins (one of Australia's foremost health policy analysts).

Professor Oliver Hart, Chair of the Economics Department, Harvard University, has agreed to be a co-editor with me of the volume of readings on Outsourcing I have been planning as a Festschrift in memorial to the late Professor Simon Domberger with my colleagues, Dr Robin Stonecash and Mr Paul Jensen. (See attached.) We are in discussions with Oxford University Press about a publication contract.

The special issue of the *Australian Journal of Management*, "Australia's Choice: Economic Strategies for a Prosperous and Fair Society," edited by Associate Professor Ian Marsh, appeared in August. On the retirement of Professor Stephen Gray (Queensland) from the *Journals* editorial board, I have appointed Associate Professor Chris Kirby (AGSM) as Area Editor, Finance.

Update of Teaching Achievements.

My Ph.D. student, Mr Tony Lawrance, presented his thesis proposal in July; it was unanimously approved. He will submit by the end of the year.

Despite the general downturn, 26 participants (almost up to last year's 29) have signed for the two-day Executive Program, Thinking Strategically, later this month. All teaching materials (overheads, exercises, questionnaires, some cases, previous exams, etc.) for MBA courses of mine are available on the Web.

Update of Service Achievements.

As well as the four people (Drs. Zauner, Bhattacharya, Stonecash, and Choe) I helped hire onto the permanent staff at the AGSM as noted in the application, I have also been instrumental in hiring Professor Murray Kemp, who commenced at the AGSM as a visiting professor for three years from 1 July, 2001.

As Cluster Head of Economics (Head of School equivalent) at the AGSM since 1993, I have had no time off teaching in lieu and no extra payment: there has been no "double dipping". I have built the Cluster back up from one member (myself) in 1994 to its present four members. We are soon to make an offer to bring the numbers up to five.

An early adapter of new technology, I launched my Web site (as well as the Cluster's) on June 6, 1996, since when it has received 9,259 hits, an average rate of 4.8 per day (and rising).