

Measured Success

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Innovation Management in Australia

Edited by Peter Cebon



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Foreword

Peter Roberts

As Australians, we think we are pretty innovative. At the beginning of the twentieth century we celebrated great local inventions such as the combine harvester and the stump jump plough; at school, we watched grainy slide shows from the CSIRO detailing the miracle of cactoblastis and how it rid the country of prickly pear; by the turn of the twenty-first century we were terribly proud of technology businesses such as Cochlear and ResMed. Unfortunately, these are the things of national myth.

The figures certainly don't support the idea that we are any sort of standout in innovation performance. First, in terms of inputs, our business expenditure on R&D, so called BERD, lags the world. It is the equivalent of 1.04 per cent of GDP. This is a little more than half the average level among OECD nations, and a third the level of the leading R&D nation, Sweden. Even Icelandic business spends at about twice the rate of Australia. BERD is not the only measure of innovation inputs, but it is still the best measure of research that leads to the creation of high-value goods and services, that leads to the employment of highly qualified engineers and scientists, and that supports businesses that can export or operate in overseas markets.

A second indicator of innovation is new high-technology company formation through venture capital. Overall our venture capital sector is the equivalent of 0.1 per cent of GDP. This is a third of the

average level among OECD nations and a quarter of the level of the leading venture capital nation, the United States. And, yes, even Iceland devotes four times the share of GDP to venture capital that we do.

A third indicator is R&D expenditure and business incubation by large companies. According to IBISWorld, only forty-four Australian companies spend more than \$10 million a year on R&D. The \$10 million is an arbitrary figure but a fair stab at the minimum needed to be internationally relevant and competitive in an established niche business, let alone what is needed to develop a new business internally. There are certainly some great companies amongst the brave forty-four. There is CSL in biotechnology, Cochlear and ResMed in medical devices, Computershare, Solution 6 and MYOB in software, and Orica, Amcor and BlueScope in industrial technologies. Notwithstanding, Australia, with all its talent, skills and advantages has only forty-four companies that are spending on R&D in a globally relevant manner.

This shows in the stock market. News Corporation led the twenty largest Australian companies by market capitalisation in December 2007. Also in the group were nine finance businesses, three resources companies and three retailers. There were two industrial companies and only one which manufactures anything, Foster's Group. Finally there were two that might loosely be called technology companies, Telstra and CSL.

Furthermore, foreign-owned companies are performing less research here too. The multinational researchers who have wound down their activities or exited Australia in the last decade include Alcatel, JDS Uniphase, Lucent and Nortel. There are some exceptions. Canon, NEC and GM Holden, for example, do research in Australia that is strategically important to their parent companies. There is just not much of it, and there is very little new international investment in R&D in Australia.

Australia's innovation performance shows up in the trade figures. Australia accounts for less than half a per cent of global exports in technology industries. But the value of technology exports from countries such as Ireland, Mexico and the Netherlands is ten times that of Australia. In 2006 our balance of trade deficit in Elaborately Transformed Manufactures (ETMs) hit \$95 billion, \$10 billion more than the previous year. You have to export a lot of iron ore to pay for

\$95 billion worth of computers, iPods, mobile telephones, cars, computers, plasma screens, medical equipment, machinery, trucks and the like. In October 2007, years into a massive mining boom, our trade deficit was getting worse, hitting a monthly record of close to \$3 billion.

Some Australians, including one of the commentators in this book, like to argue that we are behind in the most accepted measures of innovation because of our industrial structure. That is, we are heavily involved in industries that are low and medium intensity in terms of their use of technology. According to Professor Keith Smith of the University of Tasmania, this is a comfortable myth. He analysed like for like industries and found that, whether low or high technology, Australian business still spends at a lower rate than the rest of the developed world.

Clearly, it is difficult to mount an argument that Australians are particularly innovative. We are human beings, and humans are innovative, but there is no reason to believe Australians are more innovative than other nations. It may be more accurate to say we are highly innovative when we have to be.

Australia was founded as a penal colony and was later a producer of raw materials for British industry, and a market for British technology and manufactures. Britain gave us all her innovations and her technology. We imported trains and exported wool and gold. Where we had to innovate—to support wool and gold—we were highly innovative. We developed the merino, the flotation method of separating minerals, and the combine harvester, for example. But we really didn't need to be innovative elsewhere and we weren't.

Today we are still the technology supplicant. We are highly innovative where we have to be—in mining, for example. We are clearly highly innovative in banking and finance—just look at Macquarie Bank and the compulsory superannuation levy. But otherwise, we are happy importing other people's technology.

Perhaps life is just too easy for us and we needn't try too hard to be wealthy. We must ask how long this can last, and whether we can change.

If we are not to repeat the past we first have to understand the nature of our innovation achievement. This volume begins with a series of case studies that explore where we have gone right, and where we could have achieved more. It builds on the specific with an

examination of the big-picture challenges we face. Finally, it points the way ahead to fresh national policies and a time where we can take our place among the most innovative of nations.

Contributors

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Sam Burshtein is a Senior Lecturer in Innovation at Macquarie University, where his research and teaching focus on technology-based entrepreneurship and venture capital. Prior to embarking on an academic career, he spent more than two decades in executive management roles internationally, spanning both the entrepreneurial and the large corporate sectors. He was a strategy consultant with the Boston Consulting Group, investment executive with Carmel Ventures, a founder of two consulting companies and a privately owned graduate management school, and an adviser to the founders of several successful biotechnology and information technology companies. A University Medal graduate from the University of Technology Sydney, Sam also holds an MBA in Strategy and Entrepreneurship from the Kellogg School at Northwestern University and a Master of Applied Science in Bioinformatics from the University of Sydney. Sam is completing a PhD in Innovation Management at the Australian Graduate School of Entrepreneurship.

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Peter Cebon is a senior lecturer at the Melbourne Business School, where he teaches about managing innovation, innovation strategy, and the design and management of organisations. His research encompasses issues at the interface between organisational design and innovation, while he consults in the areas of organisational design and innovation, as well as their interface. Peter holds a BE (Hons) from the University of Melbourne, a Masters in Technology and Policy from MIT and a PhD in Management, also from MIT. Prior to joining the Melbourne Business School, he held research positions at Harvard University and the Swiss Federal Institute of Technology.

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Emma Dawson is a Research Fellow at the Monash Institute for the Study of Global Movements, and a PhD Candidate at the National Centre for Australian Studies, Monash University. She is an experienced freelance writer with a regular column in *New Matilda*, and her

work has been published widely in a variety of other media, including *The Australian*, *The Age* and *The Sydney Morning Herald*. Emma is a Fellow at Australian think-tank the Centre for Policy Development, and recently coedited *Social Cohesion in Australia*, published in 2007. Prior to joining Monash, she held a management position in the projects division of the Special Broadcasting Service, and was a government policy advisor in the field of cultural diversity. Emma holds an Honours degree in Arts and Media, and a Master of Media and Communications from Monash University.

Rowan Gilmore

Rowan Gilmore has, since May 2003, been CEO of the AIC, where he is responsible for leading the organisation in its mission to help businesses, research organisations and governments accelerate the commercialisation of their know-how and technology. Prior to this role, he was based in London and Geneva from 1998 as Vice President of Network Services (Europe) for the airline IT company SITA, now part of France Telecom. His career began in Asia as a field engineer in the oil industry for Schlumberger Ltd, and followed by more than fifteen years in the USA and Europe in the electronics design and telecommunications industries. He is an engineering graduate of the University of Queensland, and subsequently earned his Doctor of Science degree from Washington University, St Louis. He holds adjunct professorships in both the School of Business and the School of Information Technology and Electrical Engineering at the University of Queensland.

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Tom Greenwood is a social anthropologist specialising in both organisational development and community development. He has more than ten years of senior management experience with non-profit organisations in the UK and Australia. Tom came to Australia in 2002 to complete an MBA at Melbourne Business School, and during the course of his studies decided to migrate. Tom has continued his career in the non-profit sector, assisting organisations that include Australian Red Cross and the Brotherhood of St Laurence to find ways of becoming more flexible, accountable and effective.

Ian Heath

Ian Heath was Director General of IP Australia, the Commonwealth agency responsible for granting rights in patents, trademarks, industrial designs and plant breeder's rights from 1999 to 2008. He took a special interest in some key policy areas, including international approaches to the protection of traditional knowledge and domestic development of approaches to patenting in sensitive areas such as gene technology and business methods. He has also worked at senior levels in the fields of health, immigration and indigenous affairs. He is now the principal of an IP and business consulting firm, First Thoughts. His academic qualifications are in history, law and education.

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George Pappas is the chairman of the Committee for Melbourne. He spent more than thirty years undertaking strategy consulting work for the largest companies in the United States, Japan, Asia and Australia. In 1979, he cofounded leading Australian management consultancy Pappas Carter Evans and Koop (PCEK). When the consultancy was acquired by BCG in 1990, he became Managing Partner of BCG's Australasian offices and a member of BCG's worldwide Executive Committee. As Chairman of the Committee for Melbourne, George has led the committee's effort to support new and innovative industry development, and from 2003 to 2005 was engaged part-time as Under Secretary in the Department of Premier and Cabinet for the State of Victoria, leading a project to develop the state's future economic strategy. He holds a Bachelor of Economics with First Class Honours from Monash University and an MBA, with distinction, from Harvard Business School.

Peter Roberts

Peter Roberts is the Managing Editor of *Business Review Weekly (BRW)* and a leading editor and writer on business and management in the fields of innovation, manufacturing and government policy. Peter began his career in journalism at *The Australian* in Adelaide, and has held a wide variety of editorial and management roles in Melbourne, Perth, Sydney and Singapore, working mainly for Fairfax publications. After founding an internet-based procurement service for small

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Leonore has more than ten years' commercial experience in a variety of industries including manufacturing, energy and, most recently, early-stage technology commercialisation and business development, where she has worked with organisations such as the CSIRO, Monash Commercial and Starfish Ventures. Leonore led the team that won the 2006 Peter Doherty Prize for Innovation. She holds an MBA from Melbourne Business School and a BSc (Hons) in Chemistry from the University of Sydney, and is a graduate of the Australian Institute of Company Directors.

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Peter Styles has twelve years of leadership and management experience gained across the corporate, government and entrepreneurial sectors. He cofounded internet start-up RedBubble.com in 2006 and prior to this was Chief Operations Officer of Southern Innovation (a spin-off company from the University of Melbourne established to commercialise radiation detection research). Prior to his role at Southern Innovation, Peter was a Project Manager at Ericsson and, before that, an Officer in the Australian Army. He holds an MBA and a Masters of Engineering from the University of Melbourne.

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Evan Thornley

Evan Thornley was elected in 2006 to the Legislative Council of the Victorian Parliament and is Parliamentary Secretary to the Premier, responsible for the National Reform Agenda and Innovation. He has

been active in business, education, the community sector and public policy. He is National Secretary of the Australian Fabian Society and was, until his election, a council member of the University of Melbourne and a founding director of Getup.org.au. He is a board member of the Brotherhood of St Laurence, founding board member of the think-tank Per Capita and proprietor of Pluto Press. He cofounded and is a former CEO of internet search advertising company LookSmart (NASDAQ: Look) and, prior to LookSmart, was a management consultant with McKinsey & Company. He holds degrees in law and commerce from the University of Melbourne.

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Malcolm Thornton joined Starfish Ventures in 2003 and focuses on investments in information and communications technologies and medical devices. He is responsible for all aspects of the investment life cycle, from deal sourcing and execution through to portfolio management and exit creation. Prior to Starfish Ventures, Malcolm worked in venture capital for several years with JAFCO Investment (Asia Pacific) and in the United States in a venture-backed start-up. He has also spent many years travelling to and living in Japan, and was a Monbusho scholar researching technology commercialisation. Malcolm holds a Bachelor of Applied Science and a Master of Applied Science (Medical Physics) from the Queensland University of Technology, and an MBA from Melbourne Business School. He is the Starfish representative director for g2 Microsystems Inc, QS Semiconductor Inc and Impedance Cardiology Systems Inc and oversees the investment in ICIX Pty Ltd. He is also a Director of AVCAL, the Australian Venture Capital and Private Equity Association.

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List of Acronyms

AAS	Atomic absorption spectrometer
ABS	Australian Bureau of Statistics
ACBD	Australian Centre for Blood Diseases
AIC	Australian Institute for Commercialisation
APAF	Australian Proteome Analysis Facility
APS	Asia Pacific Specialty Chemicals Limited
APT	Australia Pacific Technology Pty Ltd
ASX	Australian Stock Exchange
ATG	Australian Technology Group
ATS	Associated Tin Smelters Pty Ltd
AVCAL	Australian Venture Capital Association Limited
BAA	British Aerospace Australia
BBOC	Bottom-blown Oxygen Cupel
BCA	Business Council of Australia
BERD	Business Expenditure on R&D
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CHF	Congestive heart failure
CPAP	Continuous positive airway pressure
CRC	Cooperative Research Centre
CRL	Charles River Laboratories
CRPS	Charles River Proteomics Services Ltd
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	Chief Scientific Officer
ECG	Electrocardiogram
EEG	Electroencephalogram
EMG	Electromyogram
EPO	European Patent Office
ESI-TOF-MS	Electrospray ionisation time-of-flight mass spectrometer
ESOP	Employee Stock Ownership Plan
ETMs	Elaborately Transformed Manufactures
FDA	United States Food and Drug Administration
FFE	Fire Fighting Enterprises
GBC	GBC Scientific Equipment Pty Ltd

GBU	Global business unit
GDP	Gross domestic product
GHz	Gigahertz
GPO	Group purchasing organisation
HPLC	High-performance liquid chromatography
IADB	Inter-American Development Bank
IAEA	International Atomic Energy Agency
ICP	Inductively coupled plasma
ICP-OES	Inductively coupled plasma optical emissions spectrometer
ICP-TOF-MS	Inductively coupled plasma time-of-flight mass spectrometer
IEI	Integrated Electronics Industries
IP	Intellectual Property
IPRIA	IP Research Institute of Australia
IT&T	Information technology and telecommunications
JPO	Japanese Patent Office
MBO	Management buyout
MFR	Micro Fourier rheometer
MHz	Megahertz
MIM	Mount Isa Mines Pty Ltd
MS	Mass spectrometer
NAB	National Australia Bank
NASA	National Aeronautic and Space Administration
NHMRC	National Health and Medical Research Council
NSG	Nuclear Suppliers Group
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
OSAS	Obstructive sleep apnoea syndrome
PD	Product development
PET	Polyethylene Terephthalate
PMG	Postmaster General's Department
PP	Polypropylene
PSG	Polysomnography
PVC	Polyvinyl Chloride
R&D	Research and development
SASE	South Australian Steel and Energy Project
SHHS	Sleep Heart Health Study

SIA	Science Industry Australia
SPL	Spent pot linings
TAFE	Technical and Further Education
TOF	Time-of-flight
TPA	Tonnes per annum
TSL	Top submerged lance
UNSW	University of New South Wales
USPTO	United States Patent and Trademark Office
UV-Vis	Ultraviolet-visible spectrophotometer
WMD	Weapons of mass destruction
XRD	X-ray diffractometer
ZMg	Zinc Monoglycerate
ZnO	Zinc Oxide

