

Does Size Matter?

Universities competing in a global market

University of Iceland, June 4-7, 2008

Strategic options for small nations and their
institutions in response to world university rankings

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Should Australia “aspire to have one or two universities ranked in the world’s top fifty, and if so, how can that be achieved within a policy framework”.

The Honourable Brendan Nelson, MP
**Australian Minister for Education, Science
& Training**

Higher education at the crossroads: an overview paper (2002)



“More of our universities should aim to be within the top 100 internationally and I would like some of our universities to aspire to the top 10.”

The Honourable Julie Bishop, MP
**Australian Minister for Education, Science
& Training**

August 30, 2007



Policy has changed dramatically...why?

“We want our higher education system to be world class so wherever students are in this country, whatever institution they’re at, they’re getting a world class education.”

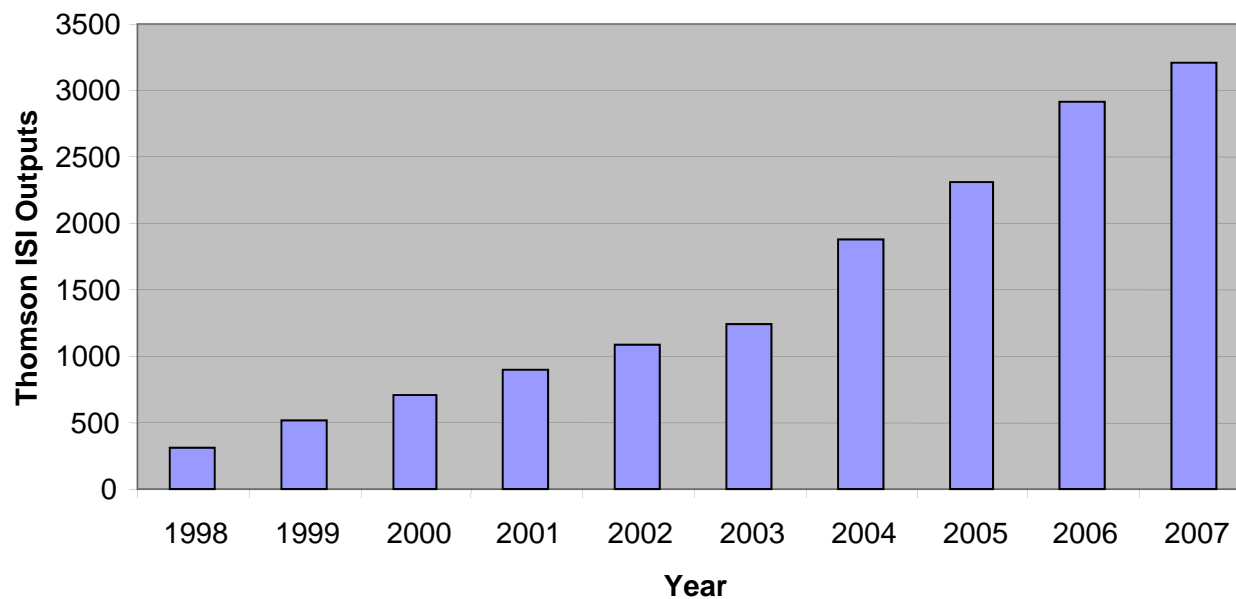
The Honourable Julia Gillard, MP
**Deputy Prime Minister and Minister for
Education, Employment and
Workplace Relations**

20 February 2008



Beginning with China

Shanghai Jiao Tong University
Thomson ISI Outputs 1998-2007



China – some important numbers

431 – number of university ‘consolidations’ between 1990 and 2006

US\$4.1 billion – additional funding provided under the China 985 Project

2016 – the year Peking University will reach top 100 status

10.5% – China’s share of world scientific output in 2006, it was 5.1% in 2001

Does size matter?

Institutional age

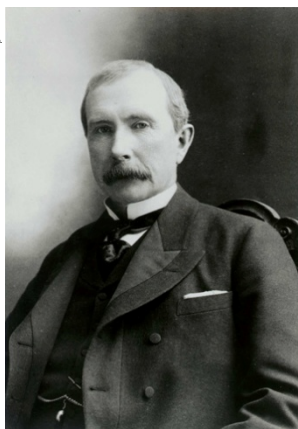
Budget

Student body

University orientation – balanced or focussed

These aspirations are nothing new...

What would be the cost of
establishing a world-class university?



John D. Rockefeller

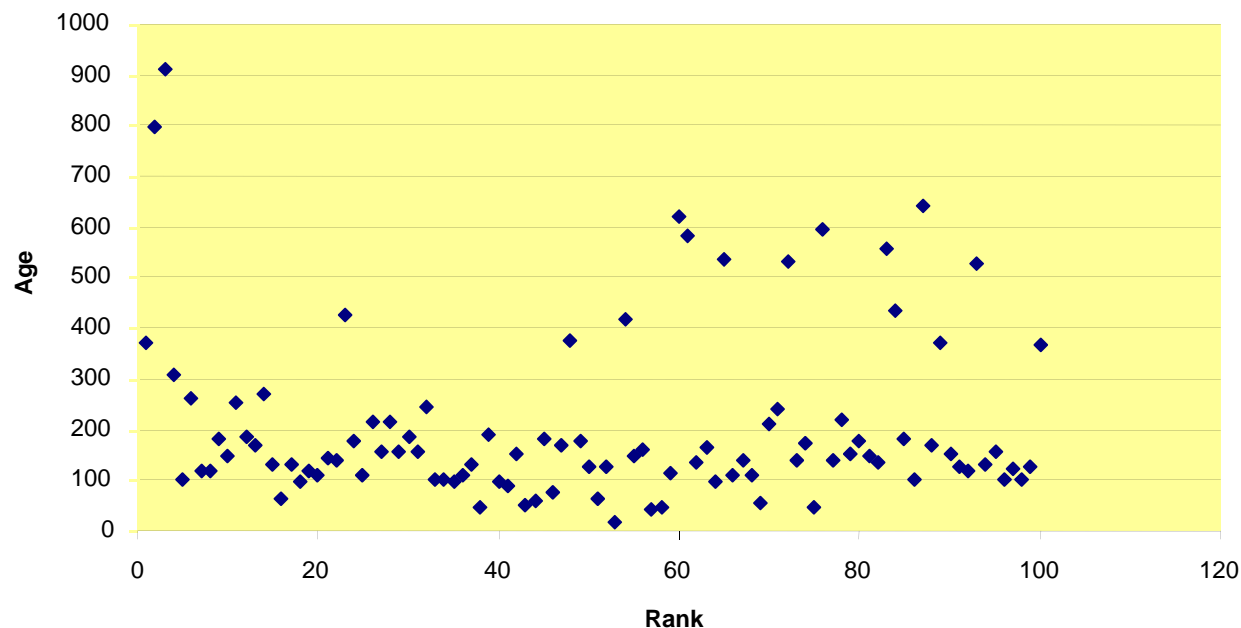
\$50 million and
200 years



Charles William Eliot, President Harvard
University 1869-1909

Average Age

Age distribution - Times HES-QS Top 100 (2007)



Shanghai Jiao Tong Academic Ranking of World Universities

191.26 years

Times HES-QS World University Rankings

190.02 years

Budget (2006) – leading US and Australian universities

Institution	Total enrolments	Budget (\$US)	\$US per enrolment
Harvard University	20,042	\$3,000,000,000	\$149,685
Princeton university	7,145	\$1,109,490,000	\$152,282
Yale University	11,358	\$1,960,000,000	\$172,565
Stanford University	14,945	\$3,400,000,000	\$227,500
University of Pennsylvania	23,980	\$5,180,000,000	\$216,013
Australian National University	11,357	\$850,000,000	\$74,843
University of Melbourne	34,000	\$1,240,000,000	\$36,470

Bringing ANU into the top 20

To bring ANU into Shanghai Jiao Tong top 20 would require 68% improvement in performance:

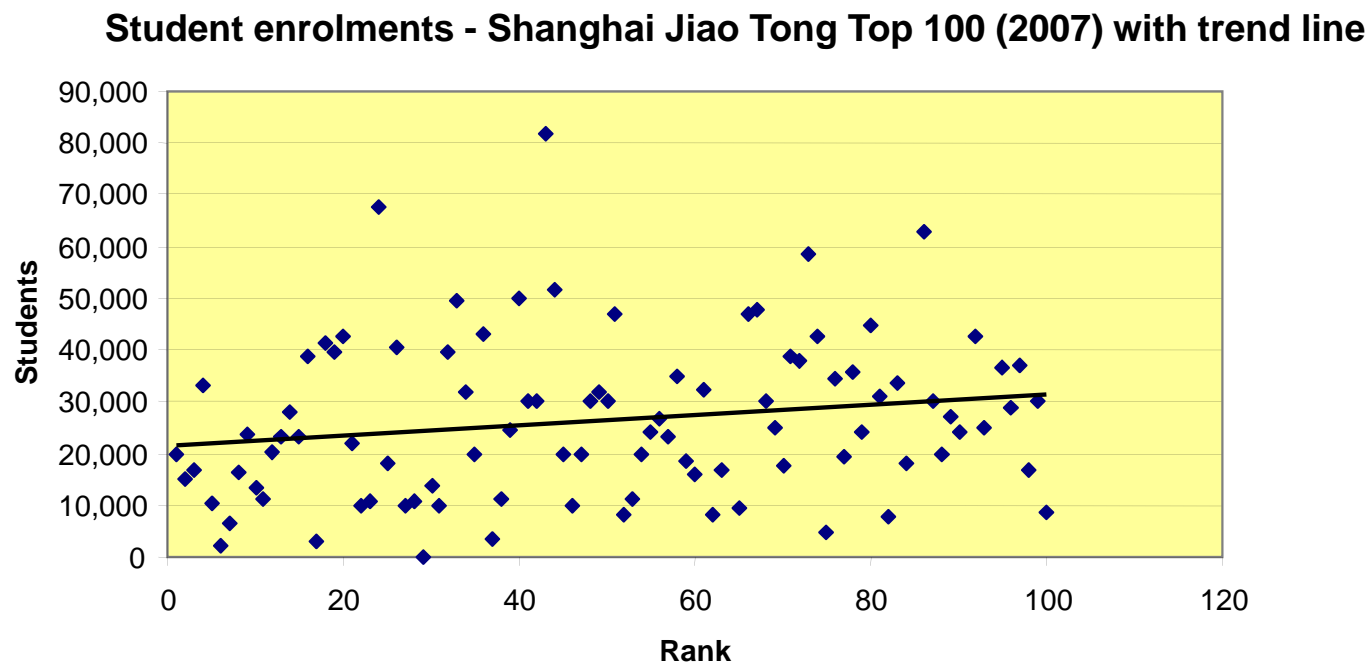
- another 16 Highly cited researchers;
- 1,292 additional Thomson ISI articles every year; and
- 48 more Nature/Science articles every five years

Budget required = US\$1.4 billion



THE AUSTRALIAN NATIONAL UNIVERSITY

Size - student enrolments



Does size matter?

Access to large pools of human and financial capital is vital.

The typical world top 20 university:

- is around 200 years old;
- has a budget of \$US2.0 billion per annum;
- endowments of at least \$US1.0 billion;
- Can recruit and retain the very best academic staff;
- has a student body of <25,000
- highly selective entry.

Snapshot of small nation performance

14 small nations* analysed:

Australia, Austria, Belgium, Denmark, Finland, Hungary, Ireland, Israel, the Netherlands, New Zealand, Norway, Singapore, Sweden, and Switzerland

* Populations <22 million, GDP <2.0% of world GDP

The Scientific Wealth and Impact of Small Nations

On measures of relative performance, such as papers per person or citations per person, smaller nations outrank the G7 nations apart from US and UK.

Robert May, (1997), Science

Return for research spending demonstrated by King in 2004 by comparing scientific wealth to economic wealth. This highlighted the role that small nations play in the global knowledge economy – and the barriers faced.

David King, (2004), Nature

May's 1996 analysis repeated 10 years on

Scopus database 1996-2006

27 subject areas, citations per document

- 11 small nations dominate top three positions
- Switzerland in 17 top three positions against US in 12
- Denmark (9) and Sweden (6) placed ahead of UK (3)
- Nordic nations placed in top 5 in 20 out of 27 fields

One subject category – Medicine*

Rank	Country	Documents	Cites per document
1	Iceland	1,427	18.58
2	Finland	28,722	15.41
3	Uganda	1,084	14.22
4	Netherlands	93,035	14.07
5	United States	1,076,109	14.00

* Minimum of 1,000 documents over 10 year period

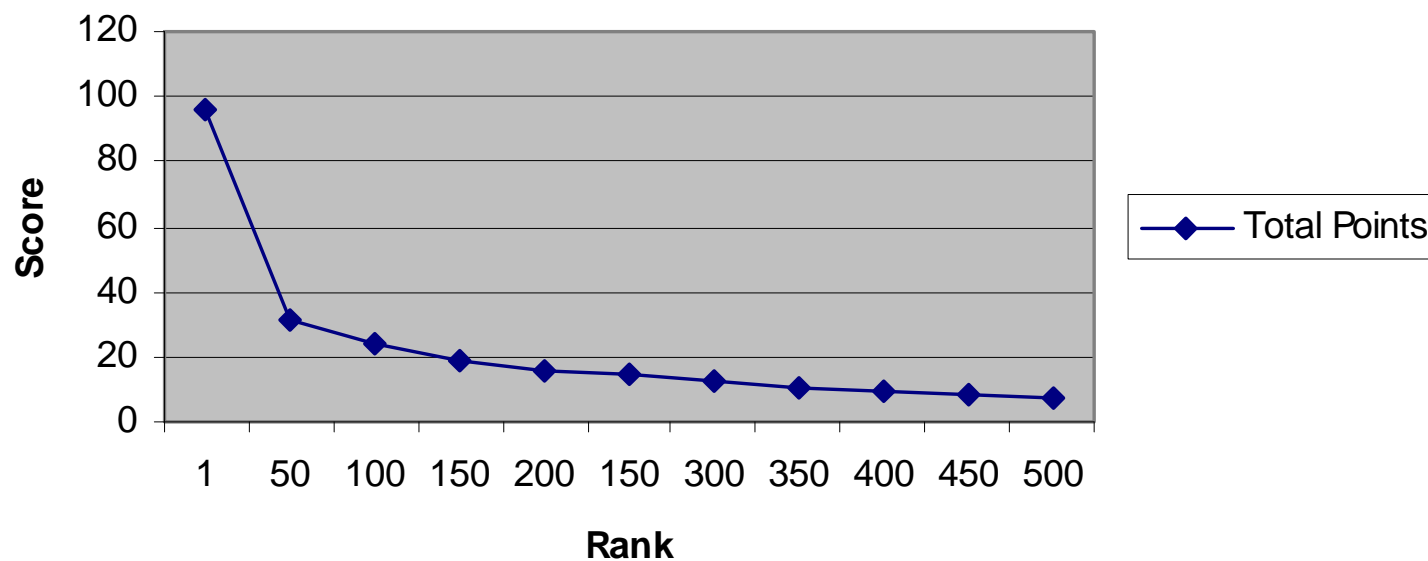
The Problem

As a group, universities from small nations are amongst the best performers on the SJTU index represented evenly in all clusters, yet only three of these universities reach the top 50:

SJTU cluster	top 100	101-200	201-300	301-400	401-500	Total
No. universities (14 small nations)	18	23	21	17	18	97
% of Total (97)	18.5%	23.8%	21.7%	17.5%	18.5%	100%

Survival is much tougher at the very top

SJTU Rankings Distribution



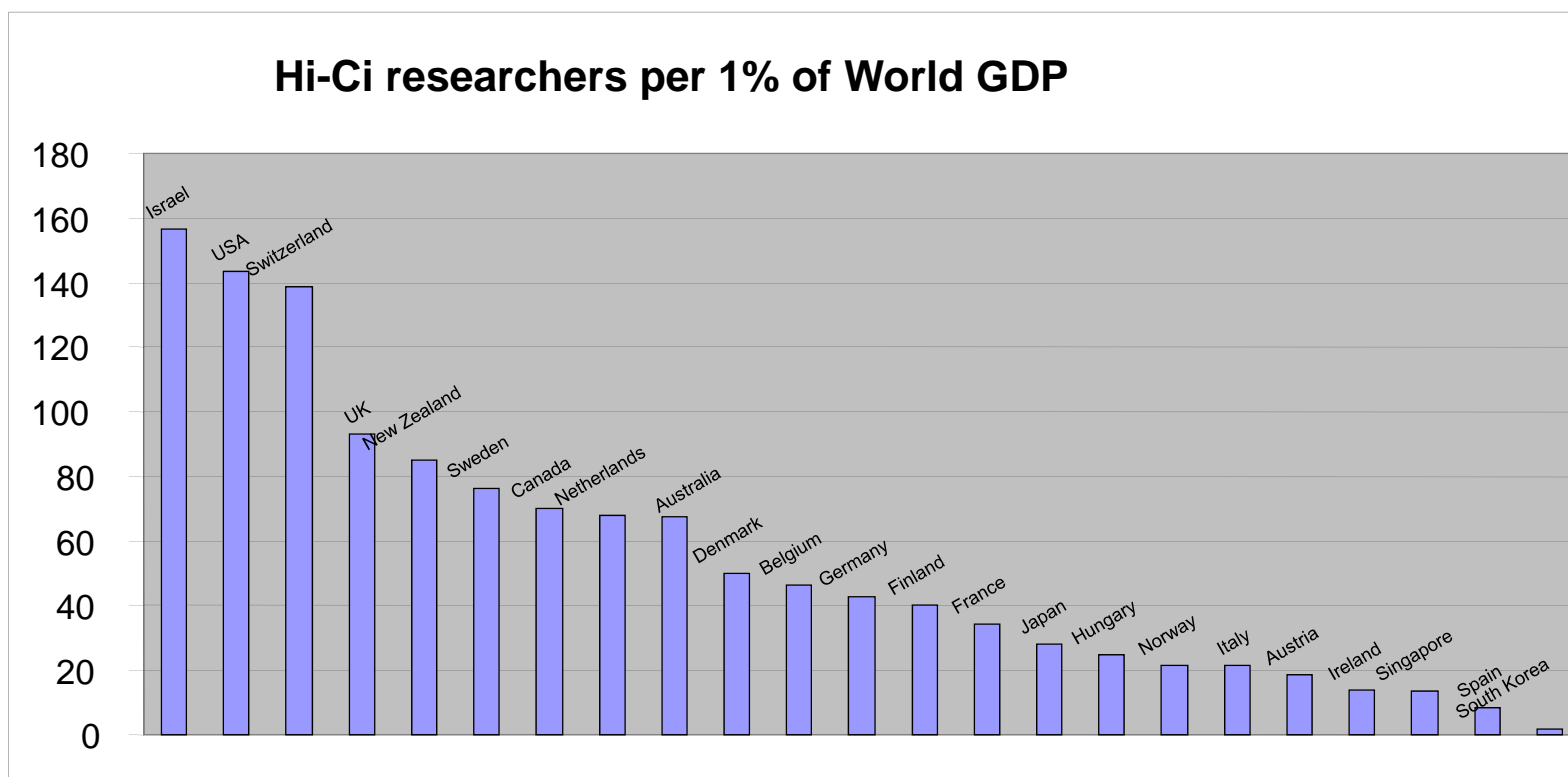
Small nations: Highly Cited researchers and Nobel Laureates (1901-2007)

Nation	Highly Cited Researchers	Nobel Prize winners
Australia	111	10
Denmark	31	14
Finland	17	3
The Netherlands	98	18
Norway	14	10
Sweden	61	28
Switzerland	113	25

Harvard University – 170 HiCis

MIT – 72 Nobel prizes (current or former members)

Highly Cited researchers



The Competitive Advantage of Small Nations

Institutions from small nations perform strongly in achieving high quality of outputs such as:

- *Science Citation, SSCI and AHCI index*
- *Nature/Science articles*

Only 12 small nation universities make the SJTU top 100 for the HiCi indicator.

Rankings by field provide institutions from small nations more opportunity to shine:

Karolinska Institute – 9th in Clinical Medicine and Pharmacy, 16th in Life and Agricultural Sciences

Can ETH Zurich make the top 20 (SJTU)?

Swiss Federal Institute of Technology (ETH Zurich)

- ranked at #27 in world (SJTU ARWU 2007)
- 1,805 Thomson ISI indexed outputs in 2006

University of Tokyo

- ranked at #20 in world (SJTU ARWU 2007)
- 6,944 Thomson ISI indexed outputs in 2006

Total ISI indexed outputs for Switzerland – 17,089 (2006)

“Small economies such as Singapore, Australia and Switzerland can’t compete with giant economies. In the global economy, small means you have to be focused and nimble, find a niche and work with partners.”

Professor Shih Choon Fong (2007)
President, National University of Singapore



Conclusions

Appropriate policy options for small nations include those designed to focus research in identified areas of excellence, maximise their collaboration with major players, and enhance their capacity for innovation which often provides first mover advantage.

In addition there are eight points which small nations ought consider carefully when framing research policy in response to rankings and globalisation.

Conclusions

1. Developing an elite (top 20) comprehensive research university is simply beyond the reach of small nations
2. Concentrate on quality, you will not match them on size
3. Mergers, done for the right reasons, produce results
4. World-class university systems can be developed and maintained in small nations by institutions taking either a comprehensive or focused disciplinary approach

Conclusions

5. Small nations should aim to enhance partnerships with global research powerhouses (LERU, U21, WUN, IARU)
6. Small nations are disadvantaged in the competition for elite academic talent
7. Undertake rigorous performance analysis and benchmarking against the best in the world (e.g. ANU or Uppsala)
8. Outsource basic research from research institutes to universities

Australia – a new era

- \$11 billion Education Investment Fund;
- \$500 million immediately – Better Universities Renewal Fund;
- Establishment of 1,000 Future Fellowships for recruitment and retention of early to mid-career researchers;
- Retention of the Federation Fellowship program;
- International focus to Australian Research Council schemes;
- The ERA initiative to fund excellence wherever it is found – not a disguised scheme for concentrating research funding.



**Questions and
discussion?**