IREG- 6 Conference

Developments in Research Assessment: towards a multi-dimensional approach

Said Taha, global director of solution services SciVal
Elsevier
20 March, 2012

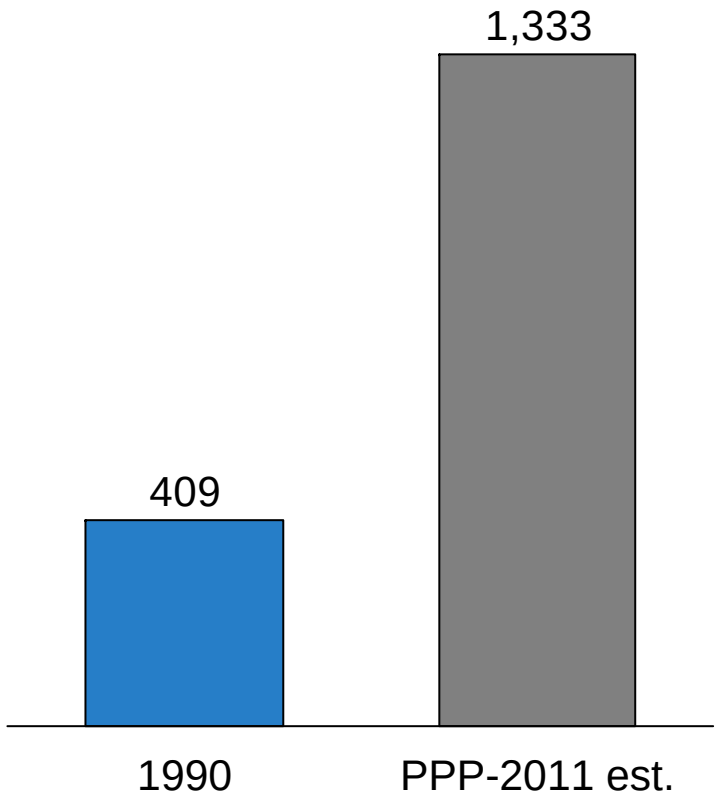
$1,333B (USD PPP-2011 est.)

$409B (USD -1990)

Source: Global R&D Magazine, Batelle (2010 estimates); UNESCO Institute for Statistics (1990 actuals)

Global R&D expenditures

$ billion



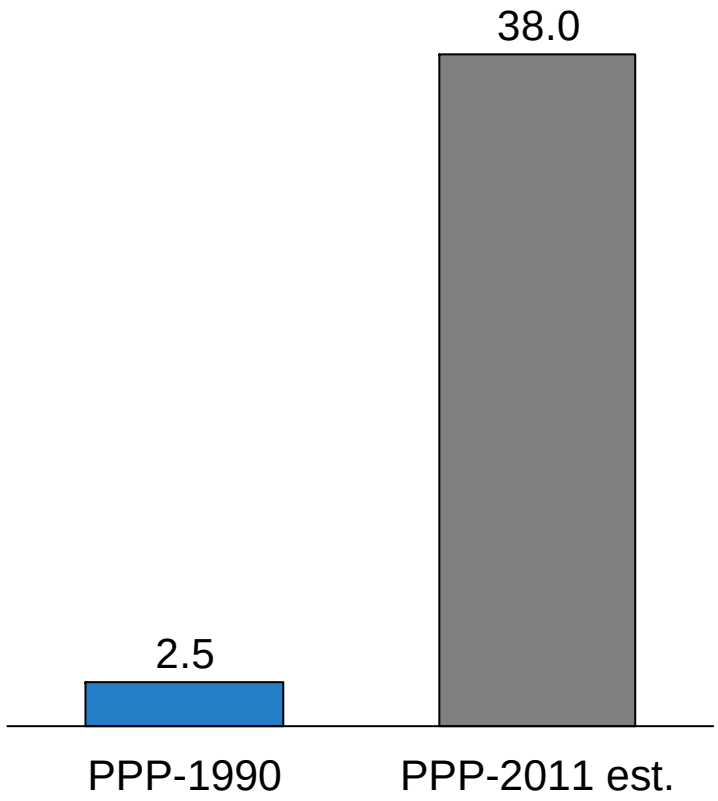
Source: Global R&D Magazine, Batelle (2010 estimates); UNESCO Institute for Statistics (1990 actuals)

$38.0B (USD PPP-2011 est.)

$2.5B (USD PPP-1990)

India

$ billion



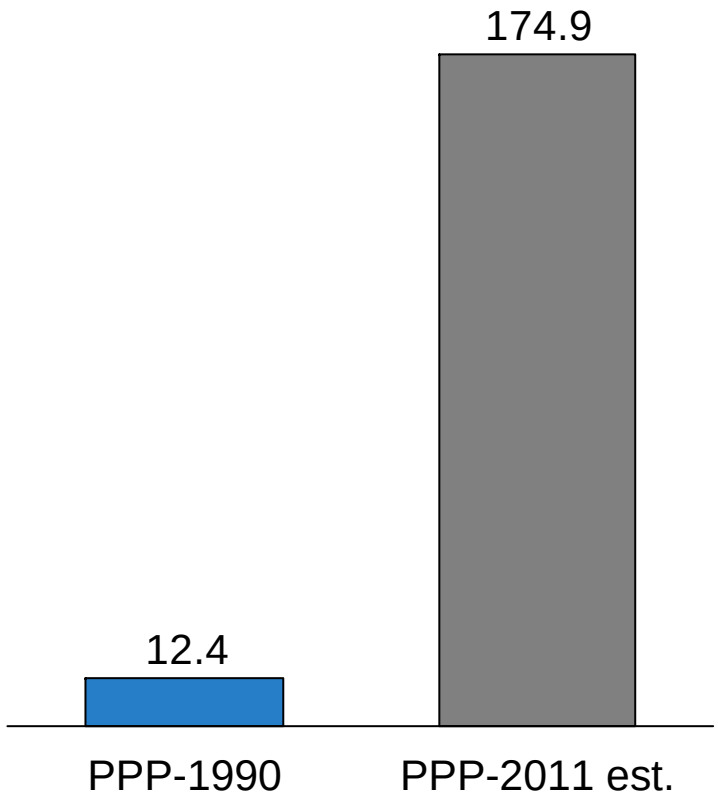
Source: Global R&D Magazine, Batelle (2010 estimates); UNESCO Institute for Statistics (1990 actuals)

$174.9B (USD PPP-2010 est.)

$12.4B (USD PPP-1990)

China

$ billion



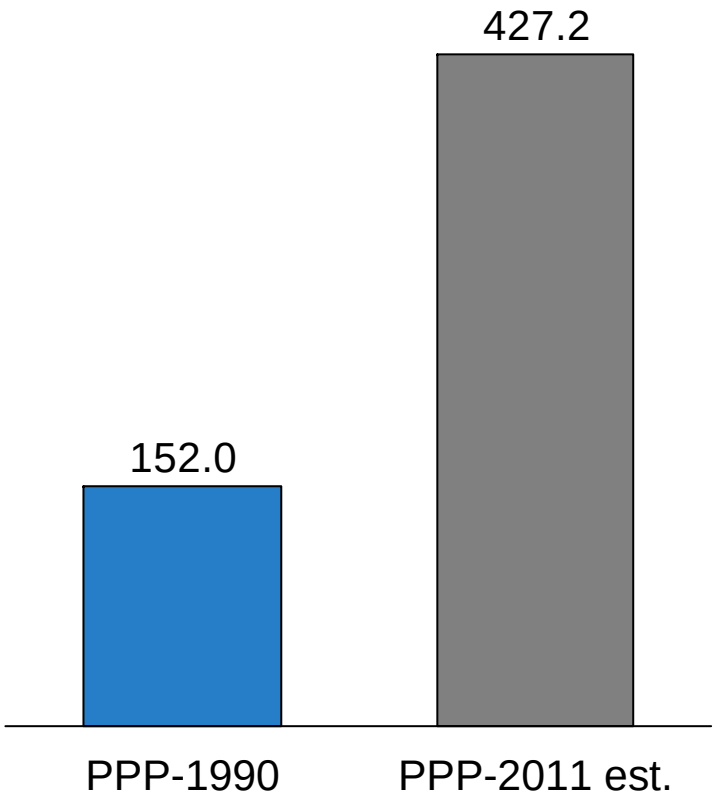
Source: Global R&D Magazine, Batelle (2010 estimates); UNESCO Institute for Statistics (1990 actuals)

$427.2B (USD PPP-2011)

$152.0B (USD PPP-1990)

US

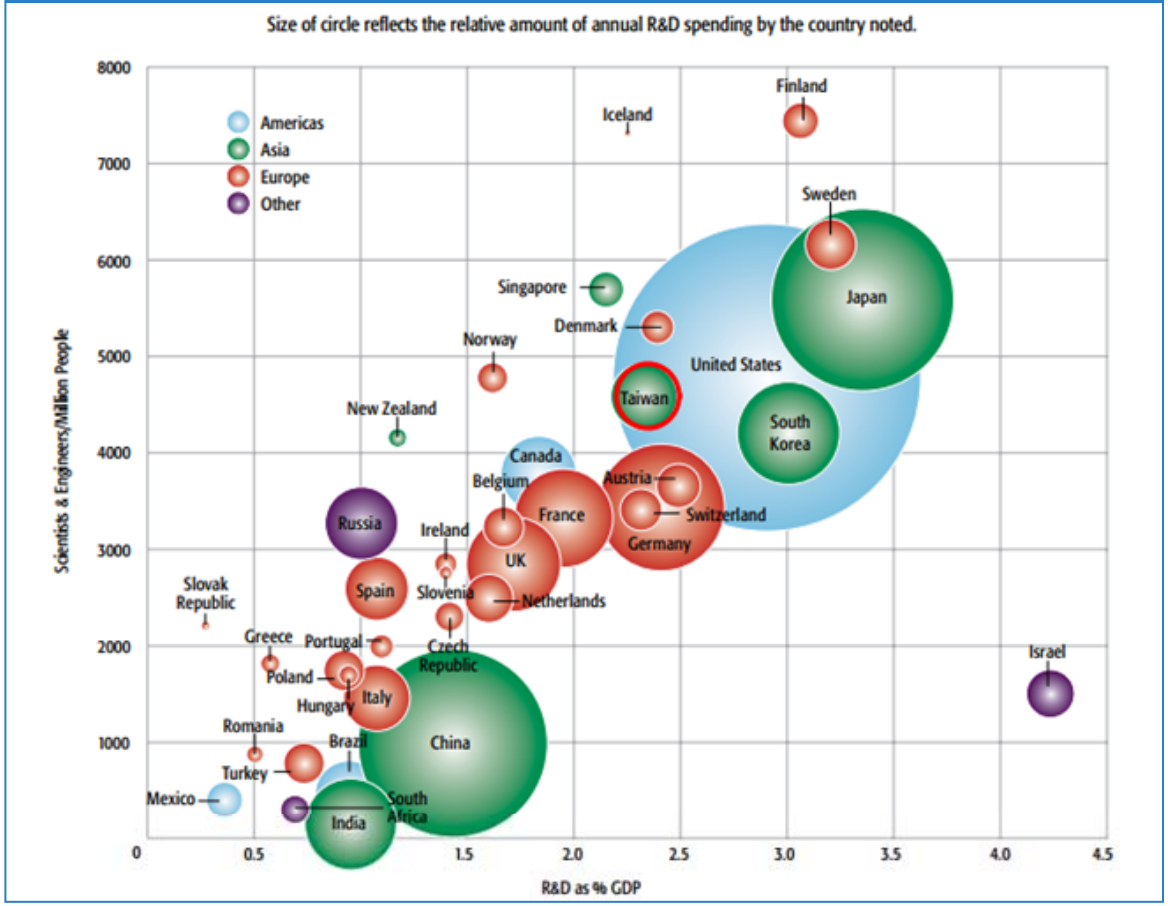
$ billion



Source: Global R&D Magazine, Batelle (2010 estimates); UNESCO Institute for Statistics (1990 actuals)

Taiwan – A Spot Not to be Missed

World of R&D 2010



Notes

- The world as a whole will spend over $1.4T on R&D in 2012
- In 2011 China spent more on R&D than Japan, at $175B vs. $152B (PPP USD)
- In 2011, India's investments in R&D were roughly equivalent to the UK's, at around $38B annually.
- U.S. R&D spending was up 2.9% over prior year to $427B
- Taiwan's GERD is ranked 11th among major OECD countries, and is expected to reach 3% by 2012*

* Source: investtaiwan.nat.gov.tw

Source: 2011 Global R&D Funding Forecast, Battelle, www.battelle.org

Top Investing Countries on R&D

Forecast gross domestic expenditures on R&D (GERD), $ Billions

Global Rank	County	2009 GERD PPP $ Billions	2009 R&D as % of GDP	2010 GERD PPP $ Billions	2010 R&D as % of GDP	2010-11 GDP Growth	2011 GDP PPP $ Billions	2011 GERD PPP $ Billions	2011 R&D as %
1	United States	383.6	2.7%	395.8	2.8%	2.3%	14,963	405.3	2.7%
2	China	123.7	1.4%	141.4	1.4%	9.0%	10,747	153.7	1.4%
3	Japan	139.6	3.4%	142.0	3.3%	1.5%	4,339	144.1	3.3%
4	Germany	68.0	2.4%	68.2	2.4%	2.0%	2,957	69.5	2.3%
5	South Korea	41.4	3.0%	42.9	3.0%	4.5%	1,512	44.8	3.0%
6	France	41.1	2.0%	41.5	1.9%	1.6%	2,176	42.2	1.9%
7	United Kingdom	37.2	1.7%	37.6	1.7%	2.0%	2,218	38.4	1.7%
8	India	28.1	0.8%	33.3	0.9%	8.4%	4,193	36.1	0.9%
9	Canada	23.2	1.8%	23.7	1.8%	2.7%	1,357	24.3	1.8%
10	Russia	21.8	1.0%	22.1	1.0%	4.3%	2,288	23.1	1.0%
11	Brazil	18.0	0.9%	18.6	0.9%	4.1%	2,253	19.4	0.9%
12	Italy	18.7	1.1%	18.7	1.1%	1.0%	1,775	19.0	1.1%
13	Taiwan	17.6	2.4%	18.2	2.3%	4.4%	839	19.0	2.3%
14	Spain	17.3	1.3%	17.2	1.3%	0.7%	1,366	17.2	1.3%
15	Australia	15.0	1.8%	15.3	1.8%	3.5%	907	15.9	1.7%
16	Sweden	11.5	3.4%	11.6	3.3%	2.6%	366	11.9	3.3%
17	Netherlands	10.5	1.6%	10.6	1.6%	1.7%	681	10.8	1.6%
18	Israel	8.8	4.3%	9.1	4.2%	3.8%	223	9.4	4.2%
19	Austria	8.2	2.5%	8.2	2.5%	1.6%	339	8.3	2.5%
20	Switzerland	7.3	2.3%	7.4	2.3%	1.7%	327	7.5	2.3%

Rankings – Benefits and limitations

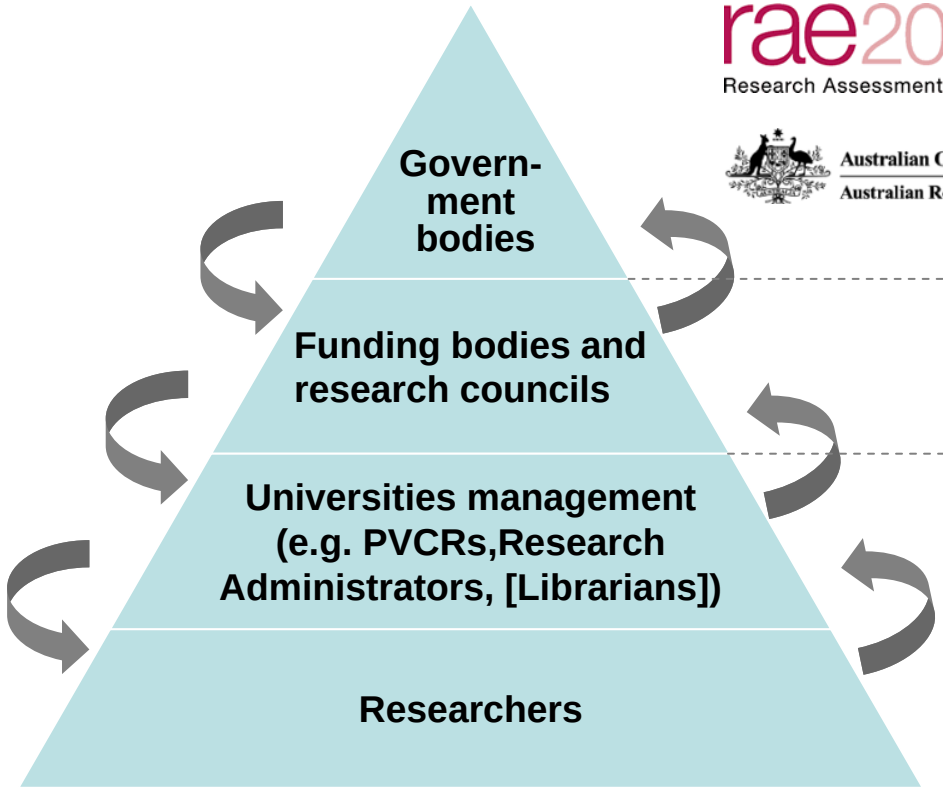
Strengths – Good general measure of university prestige, especially for comprehensive and flagship research universities, focus on research outputs, meets a need in the markets for students

Limitations – Single measure of complex institution, methodologies often questionable (20% on Nobel prizes for Shanghai Jiaotong) or manipulable, vary highly from year to year outside of top 50

Poor way to assess individuals and institutions – Difficult to compensate for size (Cal Tech w 700 students, Michigan with 50,000, Univ. Auto. De Mexico >250K), misses focused research areas, favors geographies (SHJ favors US, THE favors UK/Commonwealth, some do not have global coverage), misses quality of teaching/educational component (uses proxies like ratios)

Heavy focus on rankings in East Asia, especially allocating research funds, may be detrimental. Rankings totally ignore or miss, for instance, individual and small group research excellence, which can occur even on campuses with low research intensity

Elsevier's involvement with research assessment



rae2008
Research Assessment Exercise

Australian Government
Australian Research Council

Elsevier's SciVal Products and Capabilities

Custom reports and analytical services

Funding body solutions and services

Products, data and custom reports

SciVal Spotlight*
SciVal Strata*
SciVal Funding
SciVal Experts
SCOPUS

Elsevier's SciVal suite provides research management solutions based on data, services, and software to governments, funding bodies, research institutions

Our views on Research Assessment Matrix: rely on a Multi-dimensional, flexible framework

The multi dimensional research assessment matrix:

	Unit of assessment	Purpose	Output dimensions	Bibliometric indicators	Other indicators
1	Individual	Allocate resources	Research productivity	Publications	Peer review
2	Research group	Improve performance	Quality, scholarly impact	Journal citation impact	Patents, licences, spin offs
	Department	Increase regional engagement	Innovation and social benefit	Actual citation impact	Invitations for conferences
3	Institution	Stimulate international collaboration	Sustainability & Scale	International co-authorship	External research income
	Research field	Promotion, hiring	Research infrastructure	Citation 'prestige'	PhD completion rates

READ column wise

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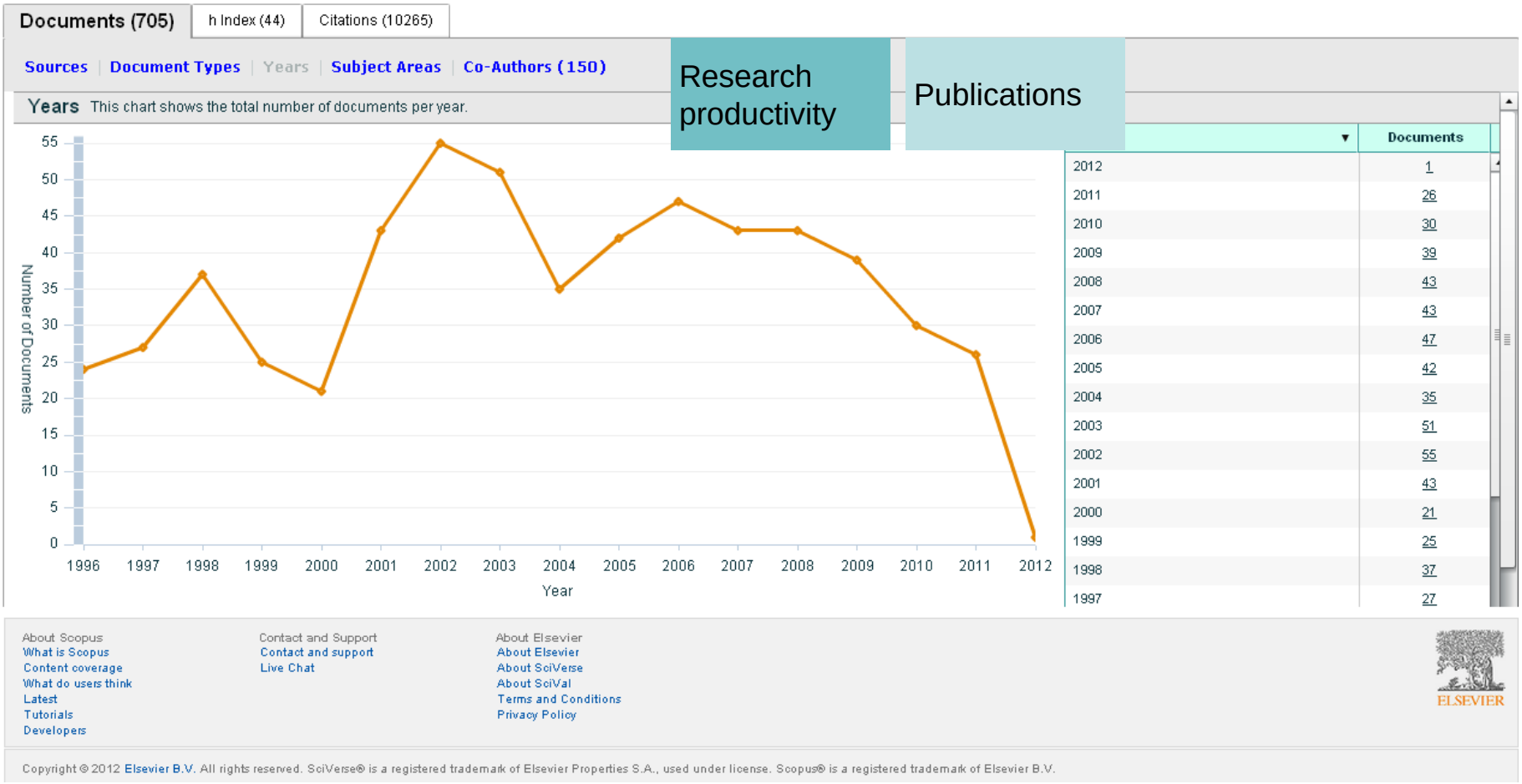
READ column wise

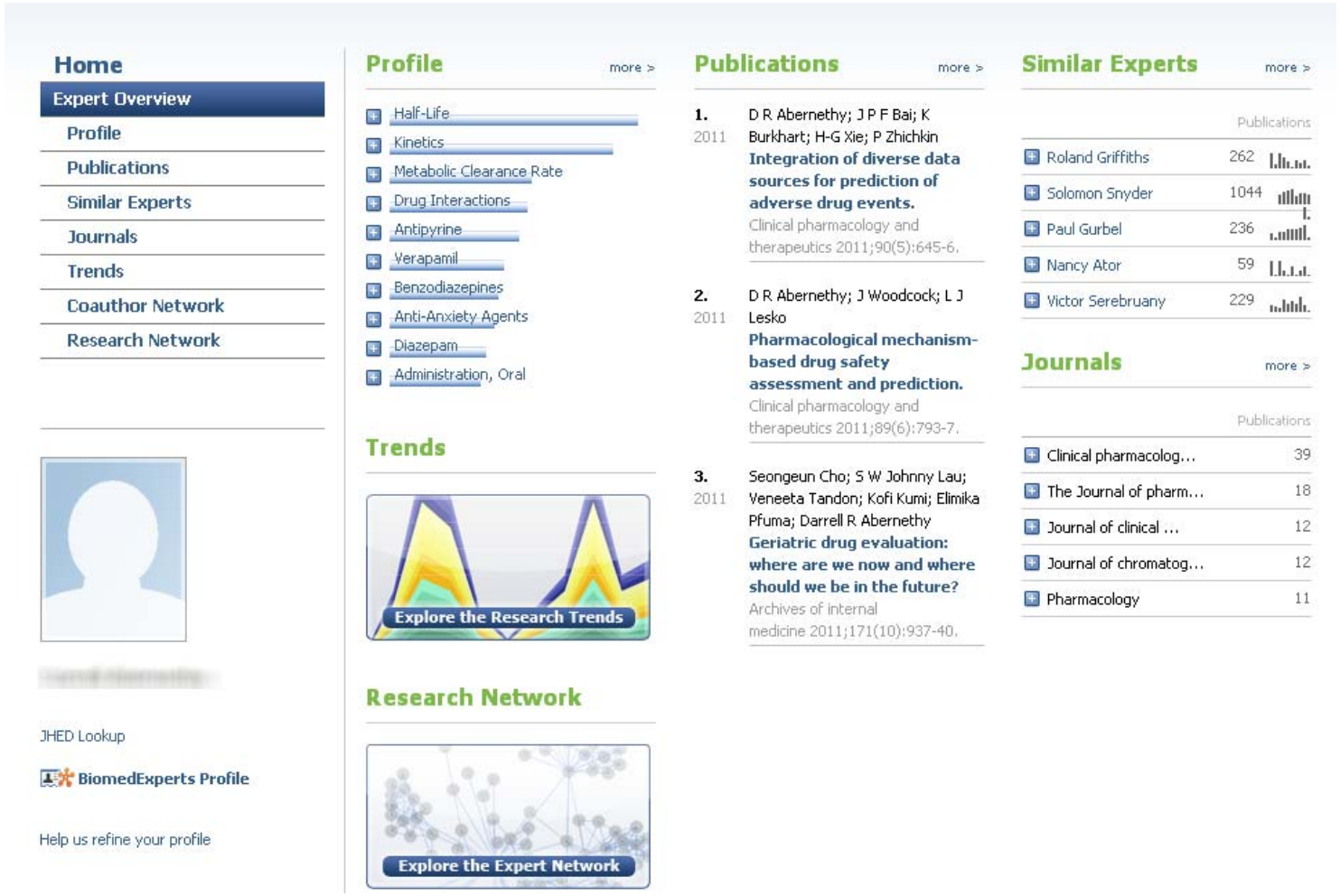
1 Evaluating A Researcher



Research productivity

Publications

① Evaluating A Researcher



Note: SciVal Experts is customized for the institution. Sample screens from other organizations provided
Source: SciVal Experts (April 2012), Universiti Kebangsaan Malaysia

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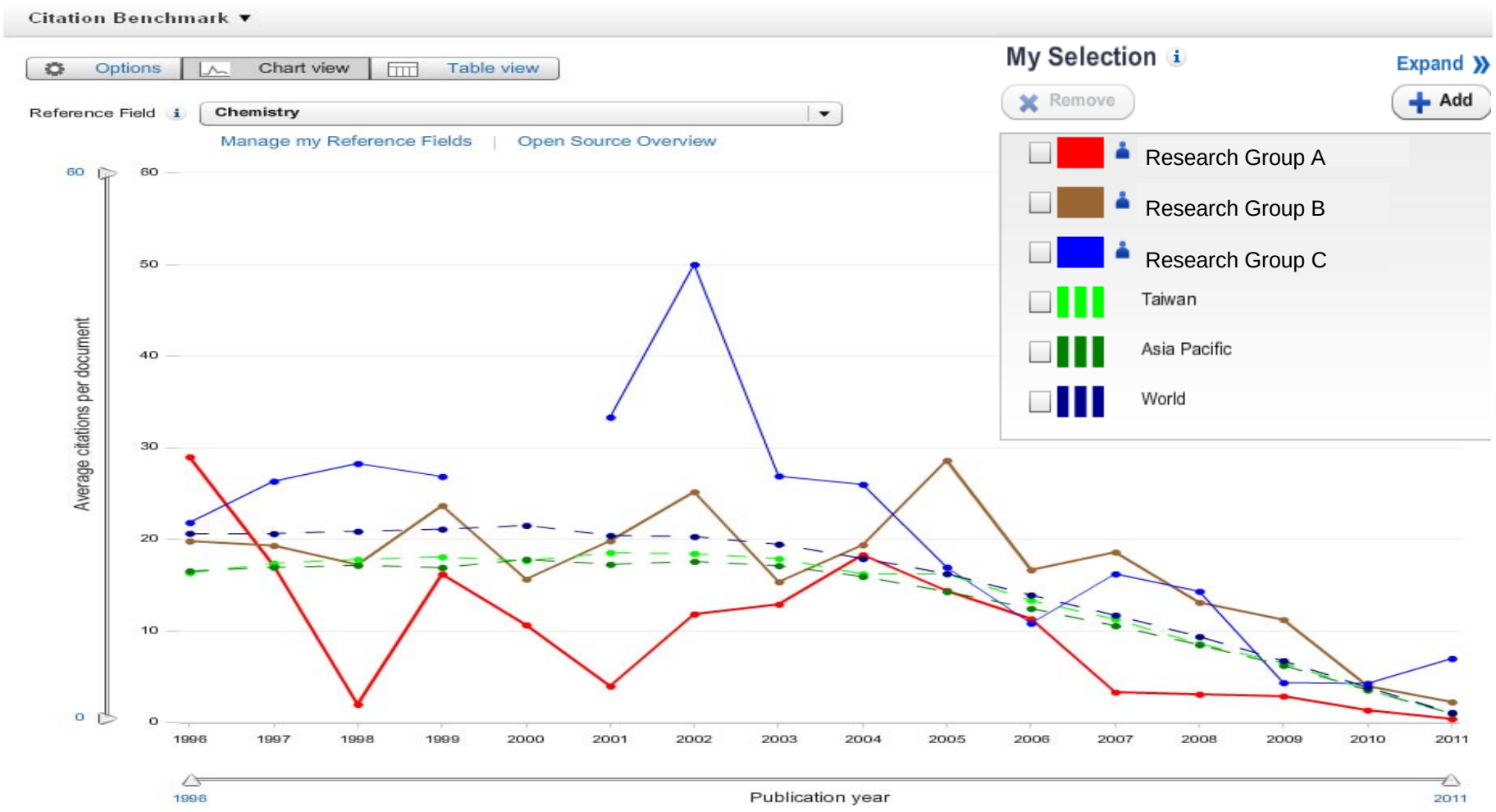
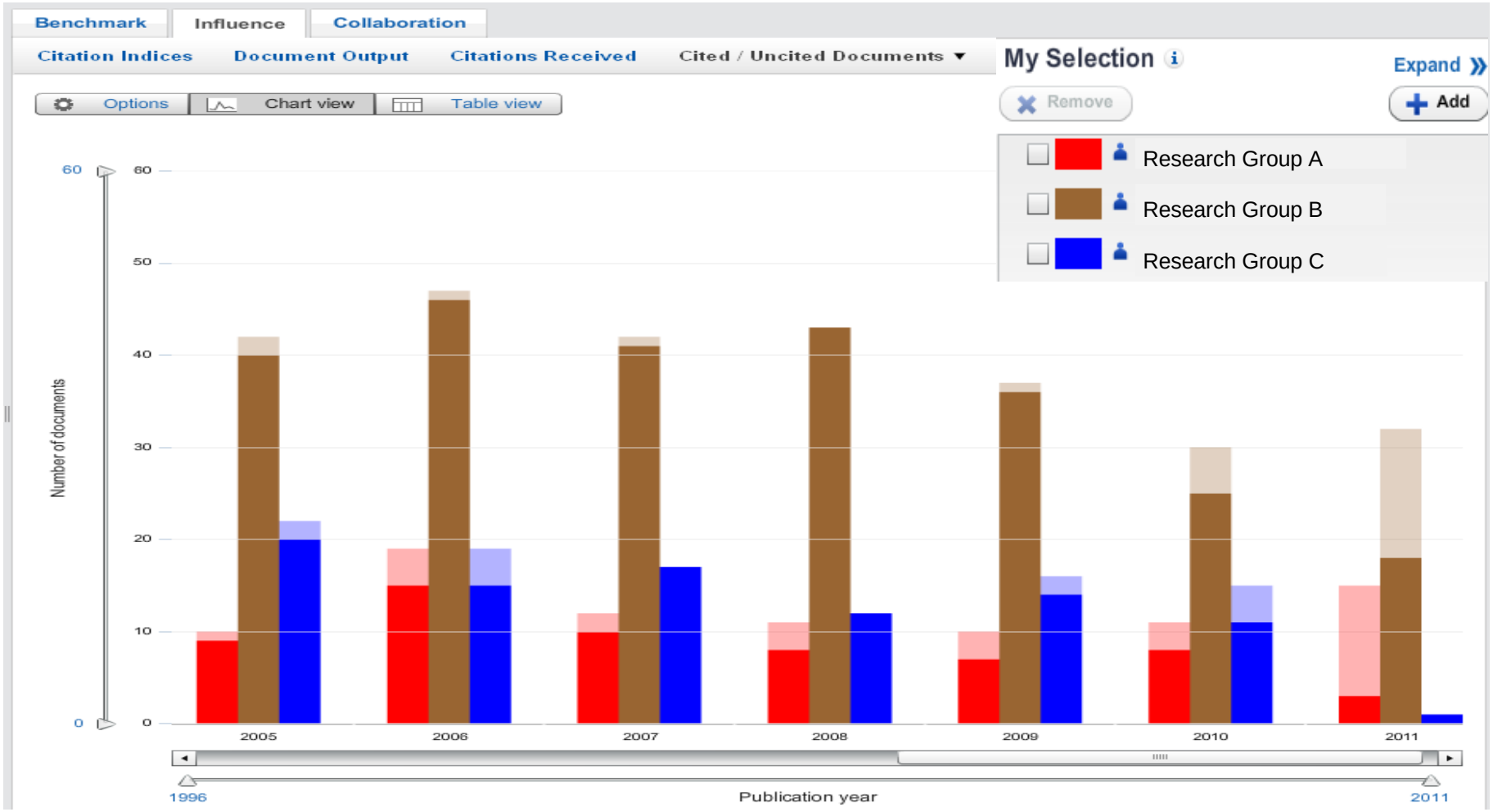
READ column wise

2 Evaluating A Group



2 Evaluating a Group



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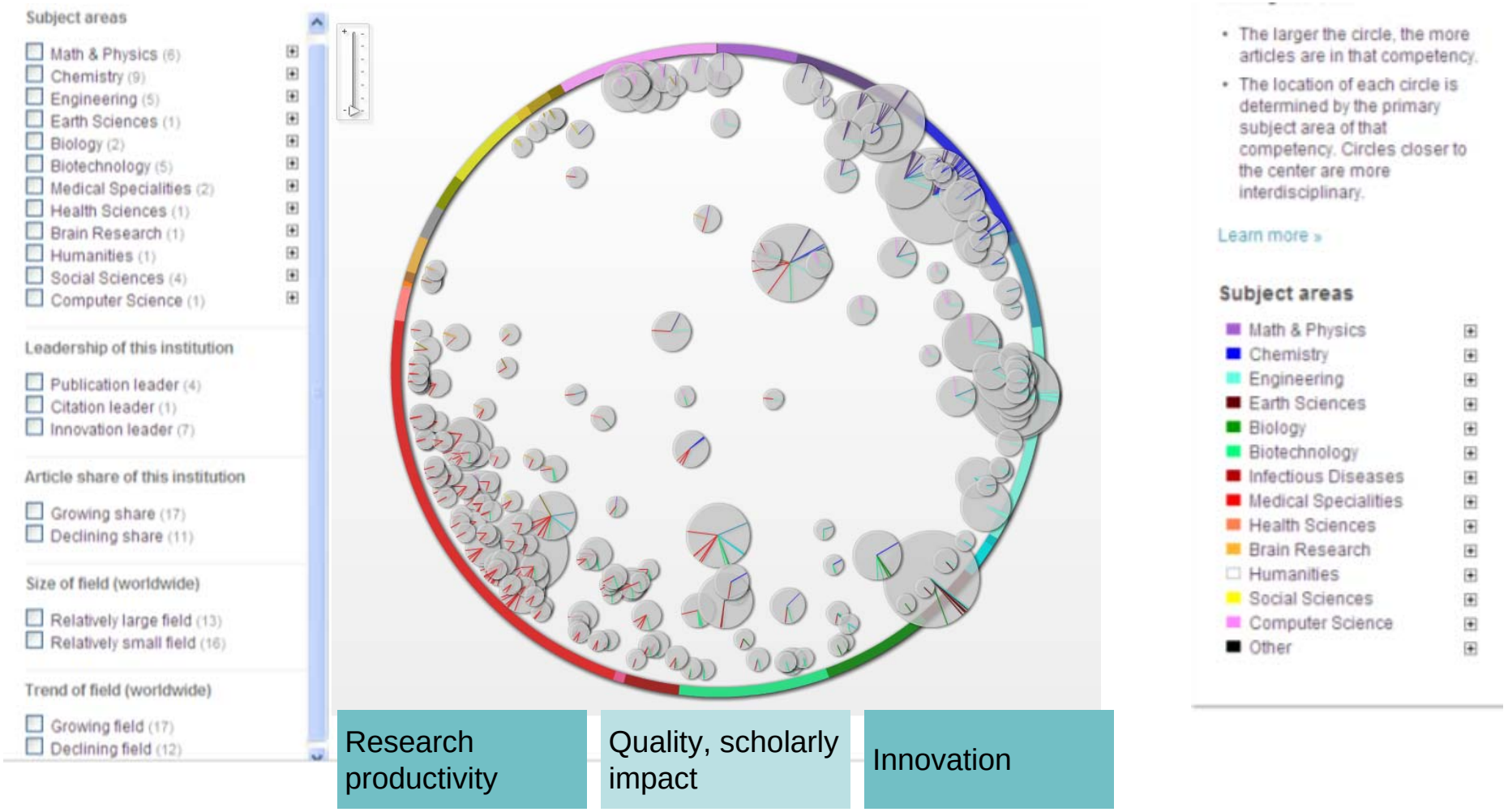
3 Evaluating an Institution



Research productivity

Quality, scholarly impact

Innovation

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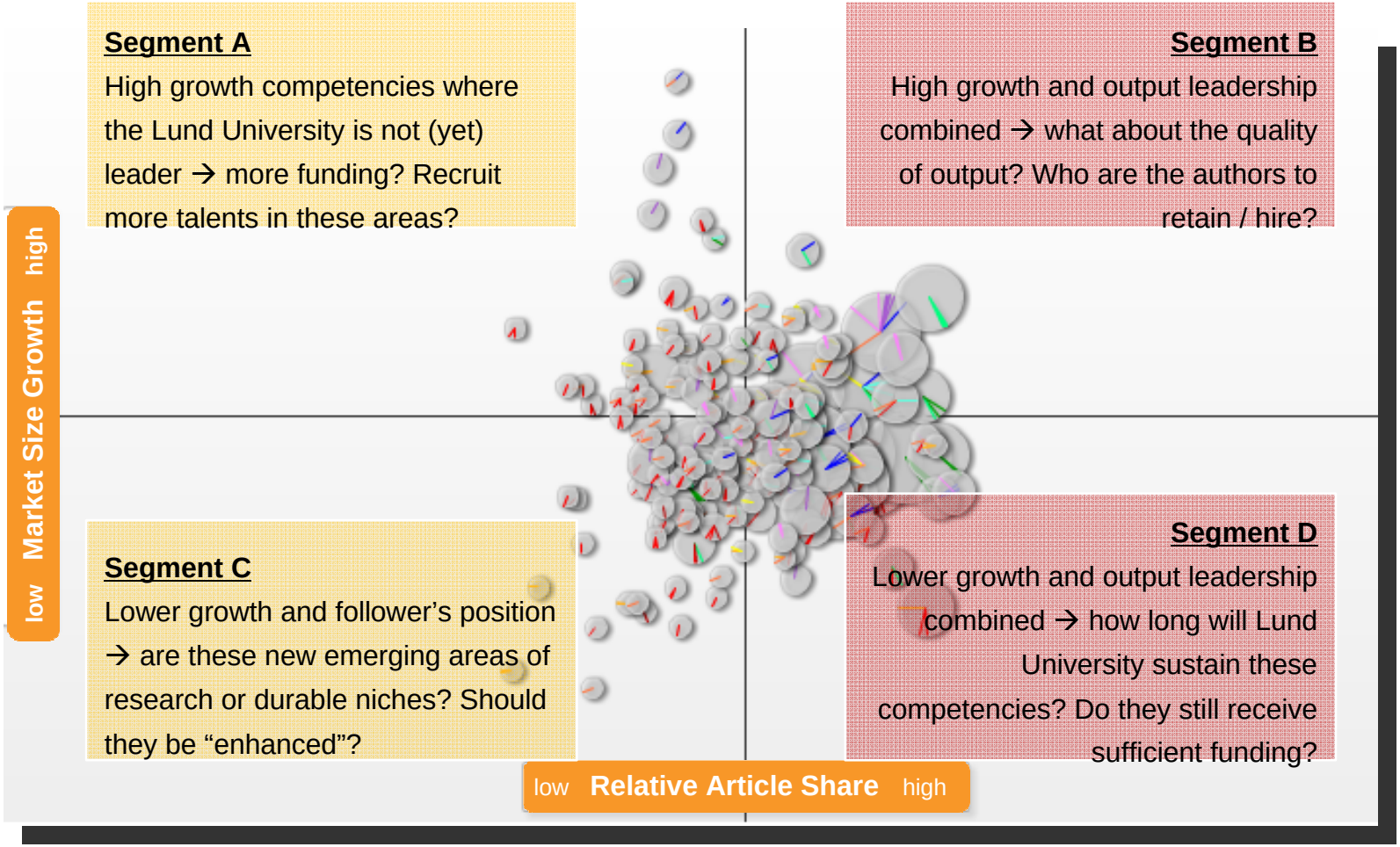
READ column wise

Strategic management of multi-disciplinary research portfolios; assess research excellence



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3	Institution ((multi-disciplinarity)	Stimulate international collaboration	Sustainability & Scale	International co-authorship	External research income
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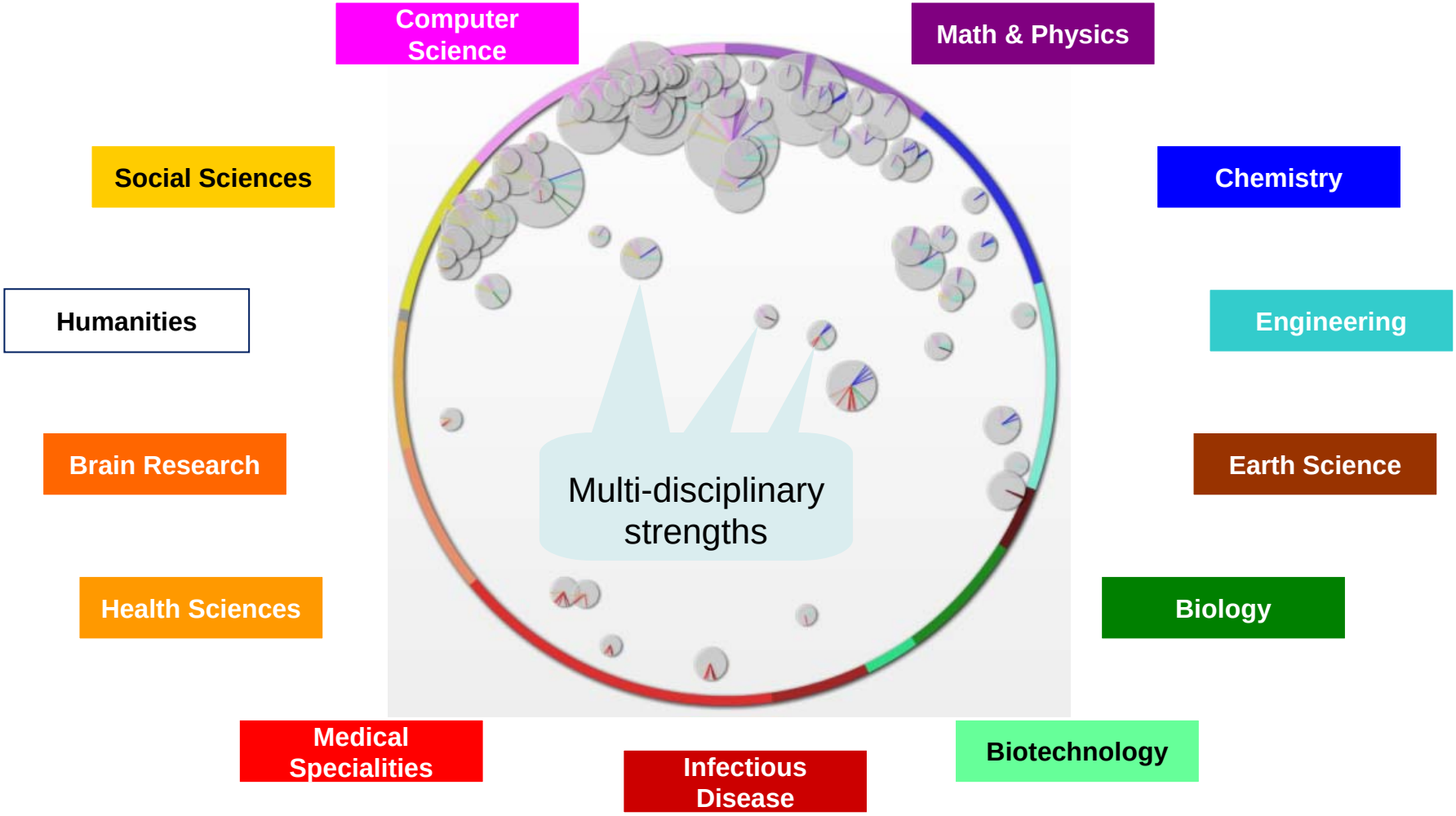
READ column wise

Assess research-strength at country level in this specific example, multi-disciplinary research strength



Source: SciVal Spotlight Taiwan 2010 country map

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READ column wise

3 Evaluating an Institution: international collaboration

SciVal Spotlight

Identify collaboration patterns

Data and analytical services to assess performance at national levels

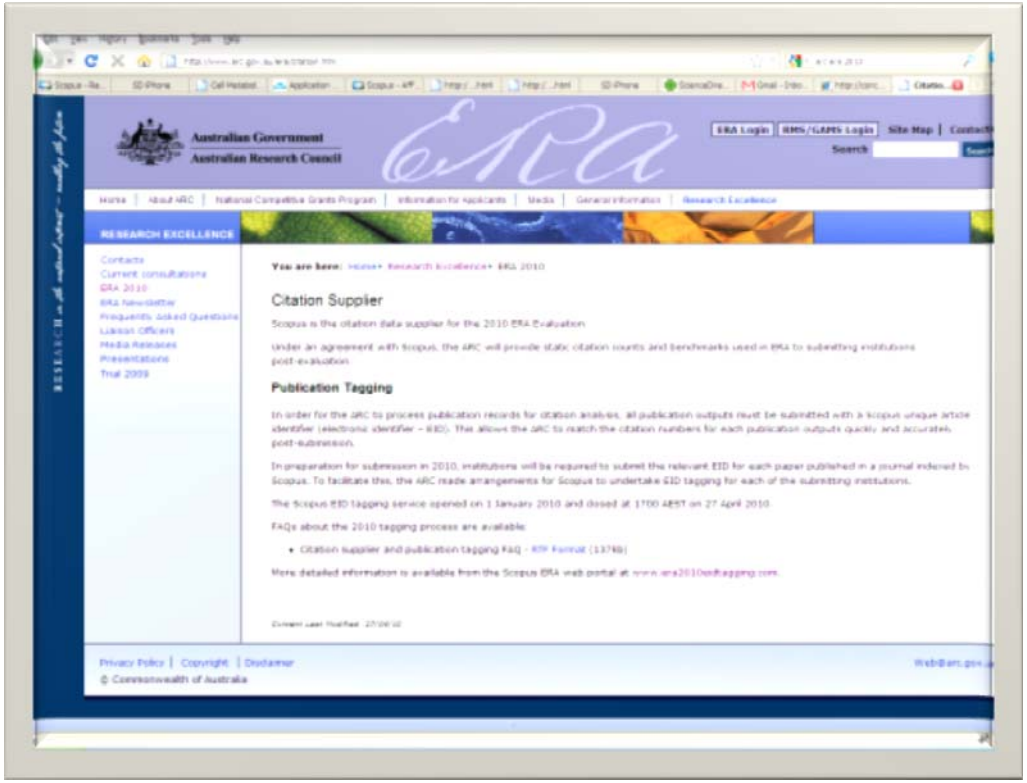
Provide support to the research evaluation exercise processes: ARC (Australia), Hefce (UK)

Provide comprehensive comparative analyses for BIS, Research Ministry UK

BIS | Department for Business Innovation & Skills

For ERA 2010, 2014, and HEFCE 2014, providing data and support services for national research evaluations

Supported by Scopus data and Analytical Services to manage the assessment process



- Assessment of research quality within Australia's higher education institutions using a **combination of indicators and expert review** by committees comprising experienced, internationally-recognized experts
- ERA uses leading researchers to evaluate research in eight discipline clusters
- ERA will detail areas within institutions and disciplines that are **internationally competitive,** as well as point to emerging areas where there are opportunities for development and further investment

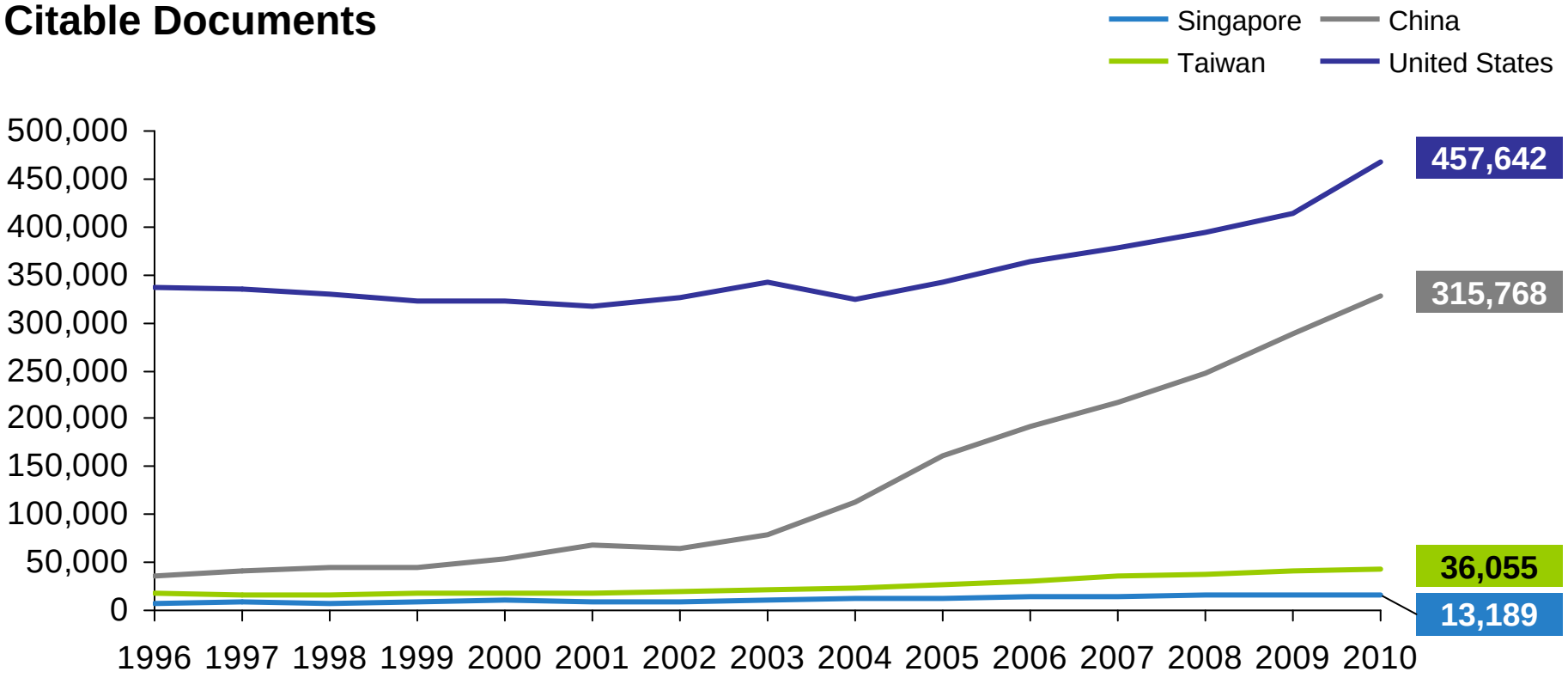
Key take Aways

- Research assessment at the core of the research environment
- Rankings an integral part
- In our view – Should be qualitative, quantitative, combination of peer review and a multi dimensional framework
- Elsevier's role as data, solution and analytical services provider
- Working with you beyond rankings and assessment – Looking and reading at publication data to refine your research strategy

Thank you

Some further research output data

Citable Documents



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Source: SCImago. (2007). SJR — SCImago Journal & Country Rank; Retrieved March 08, 2012, from http://www.scimagojr.com

Some further research output data

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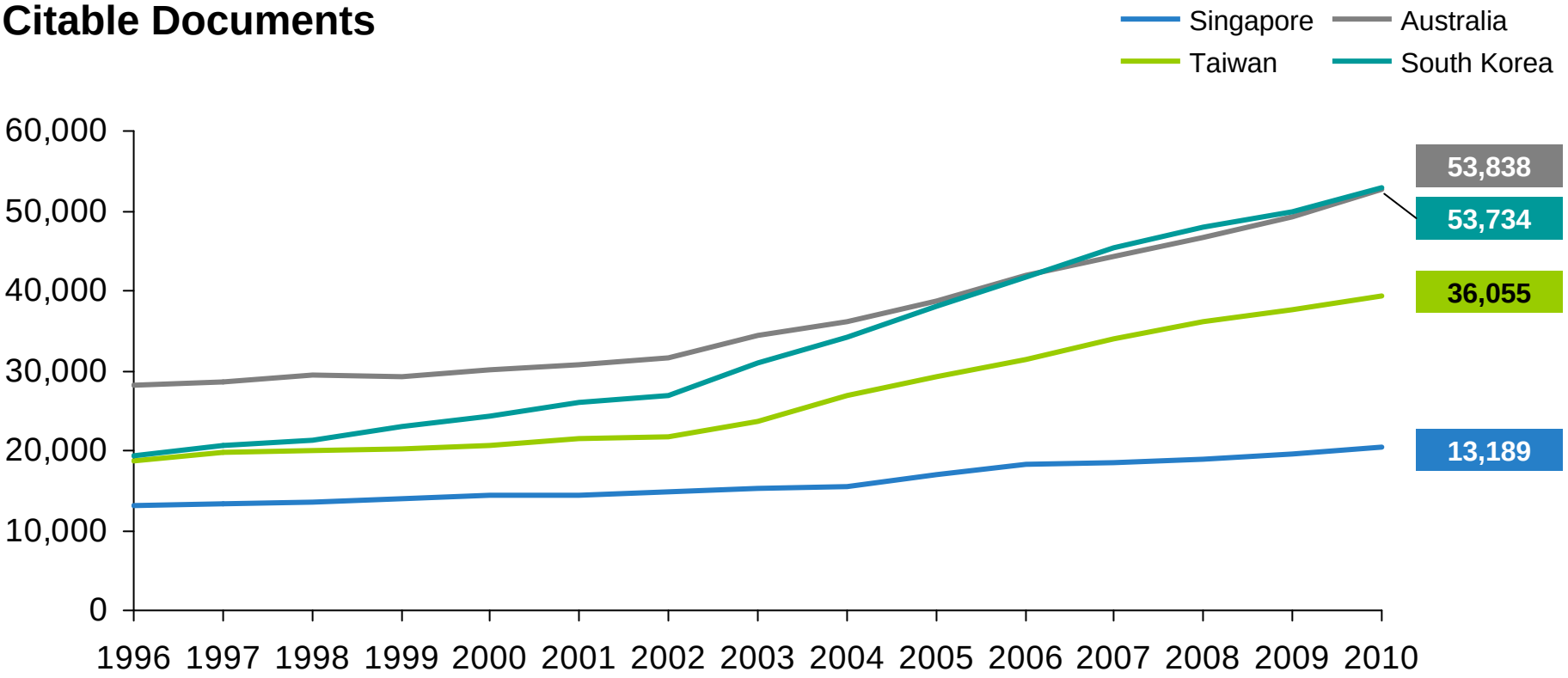

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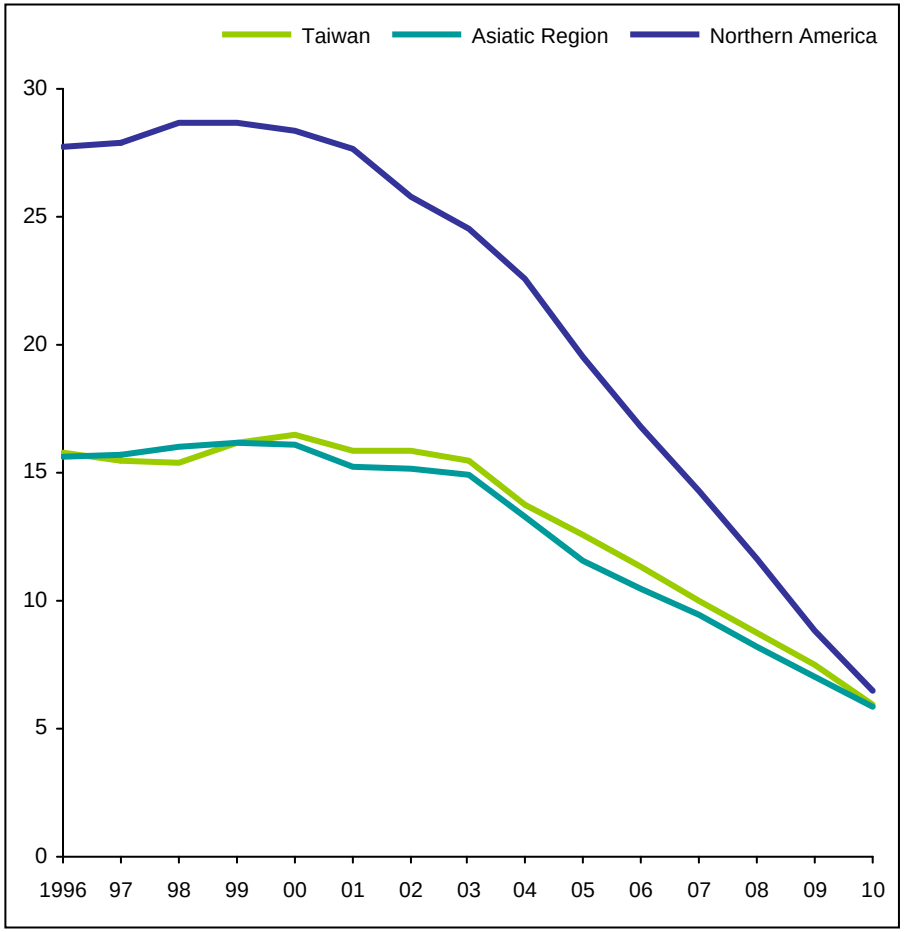
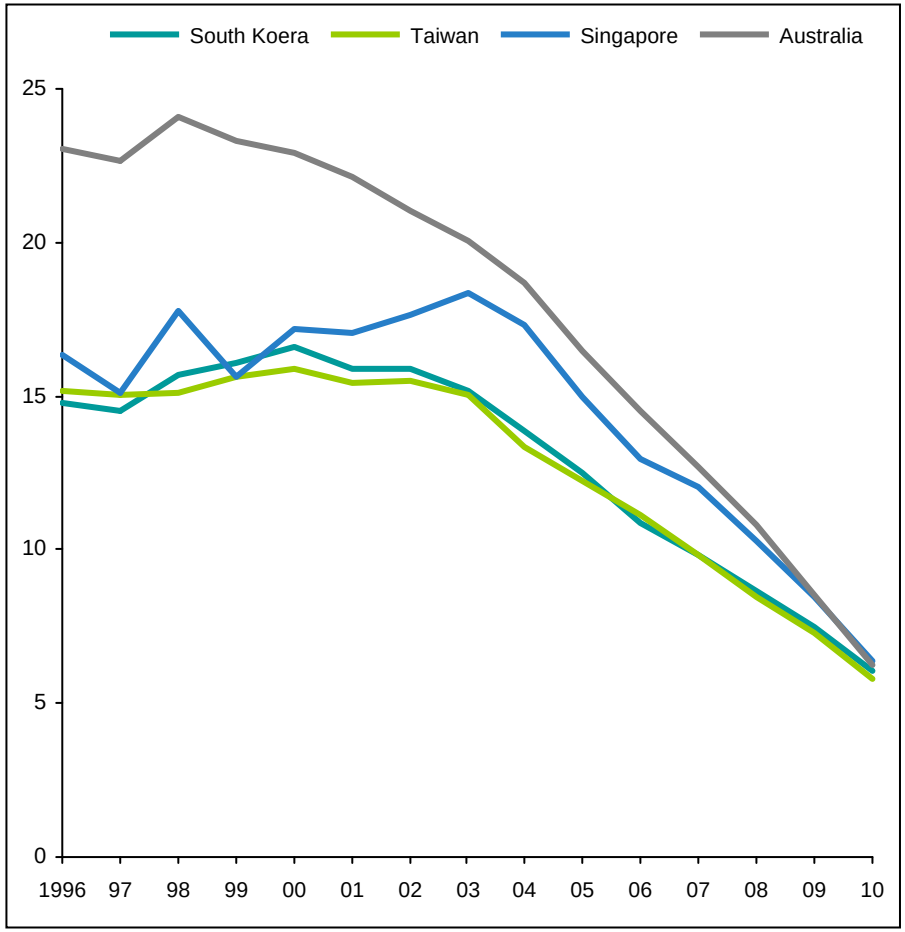
Some research impact data

Cites per Document





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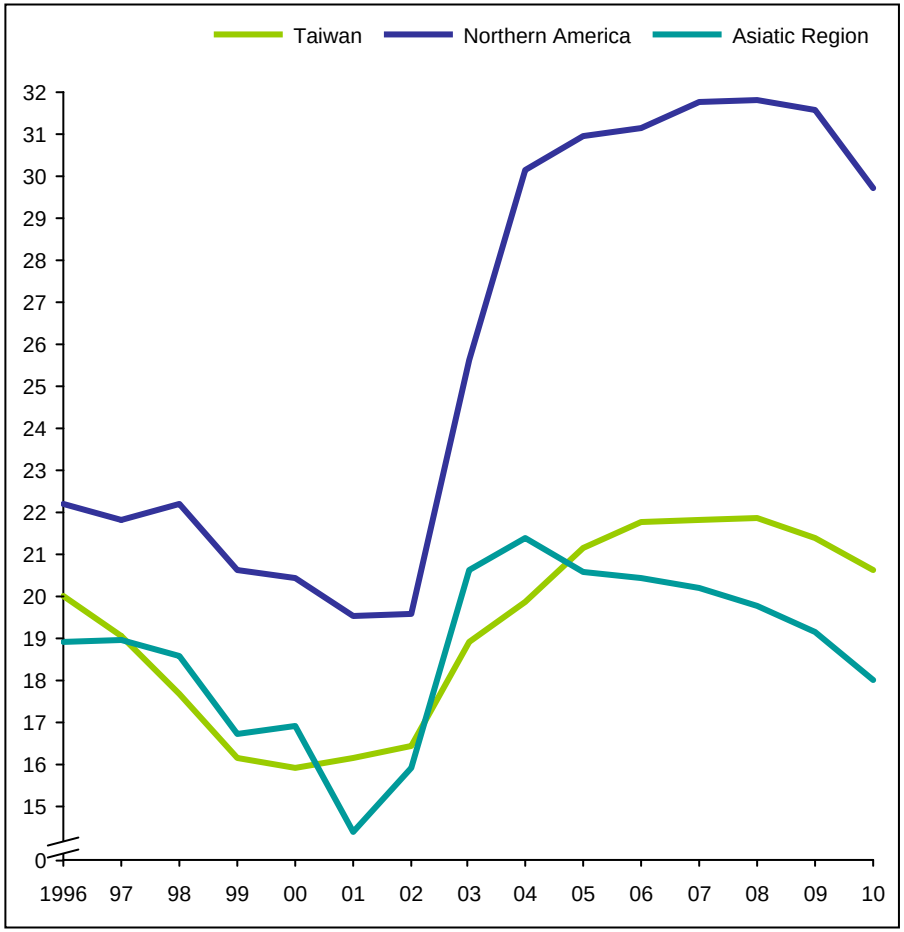
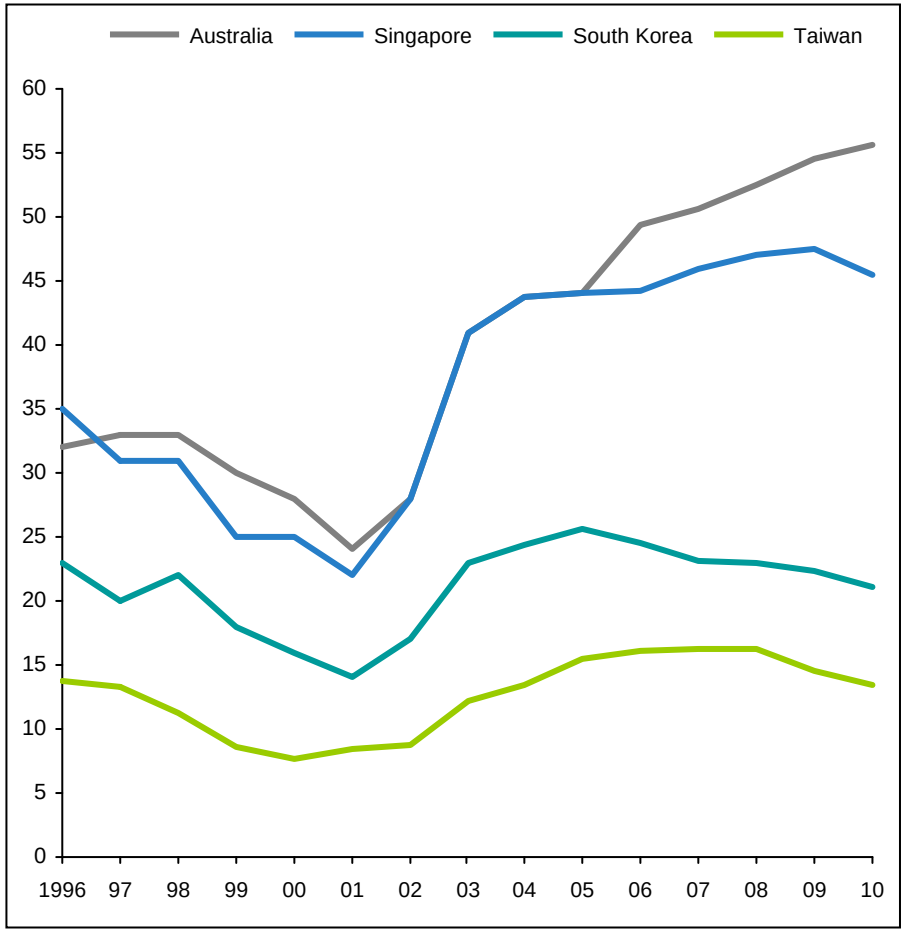
Some research collaboration data

International Collaboration





Note: Based on Scopus data