

Global, national and local higher education in 2021

JCU, 26 Nov 2020

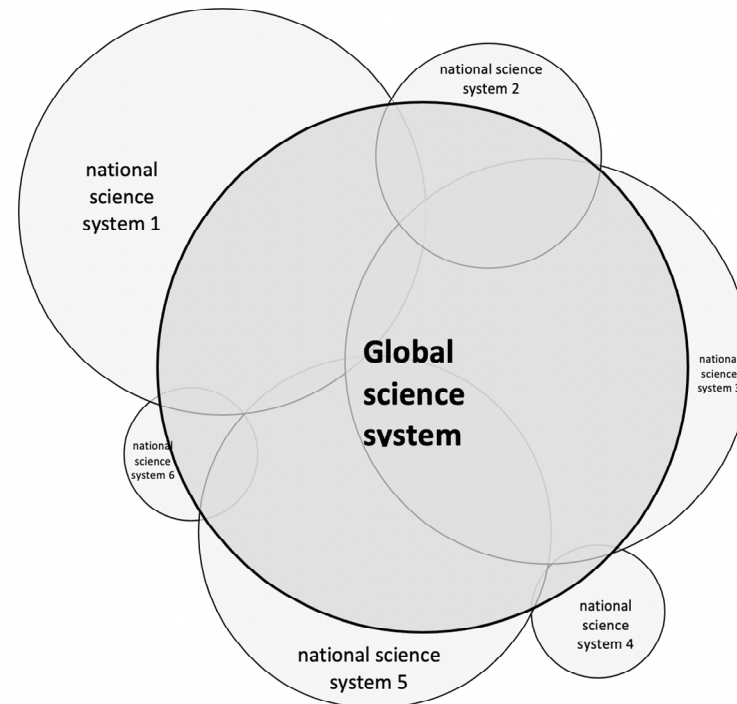
Simon Marginson / University of Oxford

1. The global research system
2. The pandemic and international student mobility
3. Asia-Pacific geopolitics and national politics

1. GLOBAL RESEARCH SYSTEM

Since the 1990s a global science system has formed, based on the common pool of papers, and held together by extensive and growing cross-border citation and collaboration (joint papers) –

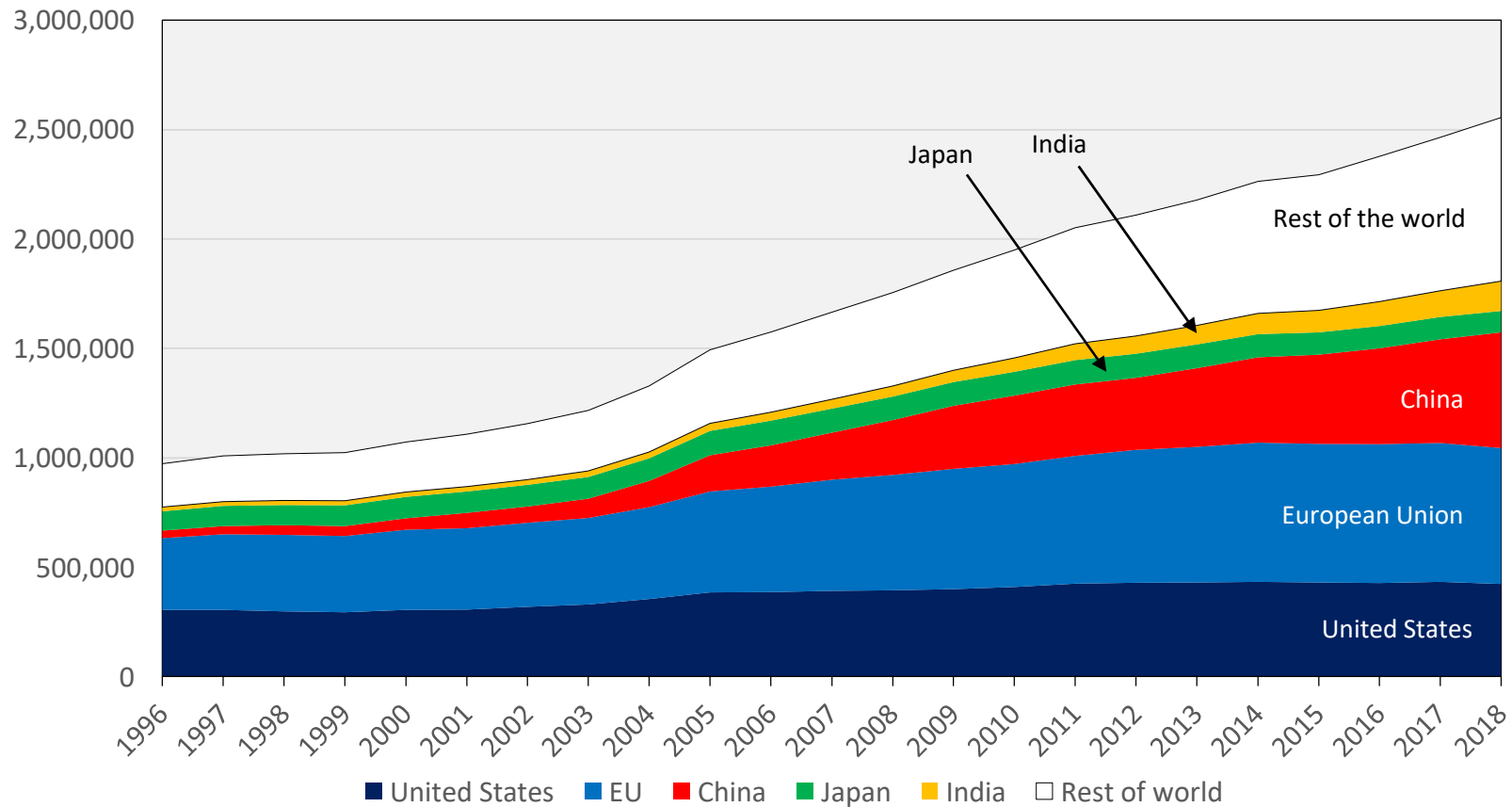
- the global science system is based on grass roots collaboration and has significant autonomy from national governments and national science systems – but the global system is ultimately supported by national and institutional funding and infrastructure
- many leading scientists wear two hats, (1) institutional/national and (2) disciplinary/global
- the longer-term future of the global science system is by no means certain



The global science system is very dynamic

- **Growth:** Rapid increases in many countries in R&D spending and growth of published science papers at 5 per cent a year from 2000-2018
- **Diversification:** Science no longer an oligopoly of North America, Europe and Japan. Spread of national science capacity to many more countries
- **Networked cooperation:** Rapid growth of co-authorship in science at both global and national levels, everywhere. International collaboration the main form of activity in leading research universities
- **Pluralisation:** Widening of group of leading science countries, rise of semi-independent systems in China, South Korea, India, Iran, Brazil etc (though US science remains very strong and globally central)
- **Global integration:** Increase in the weight and role of the global science system vis a vis national science systems. But geo-political tensions now threaten the autonomy of global scientific cooperation

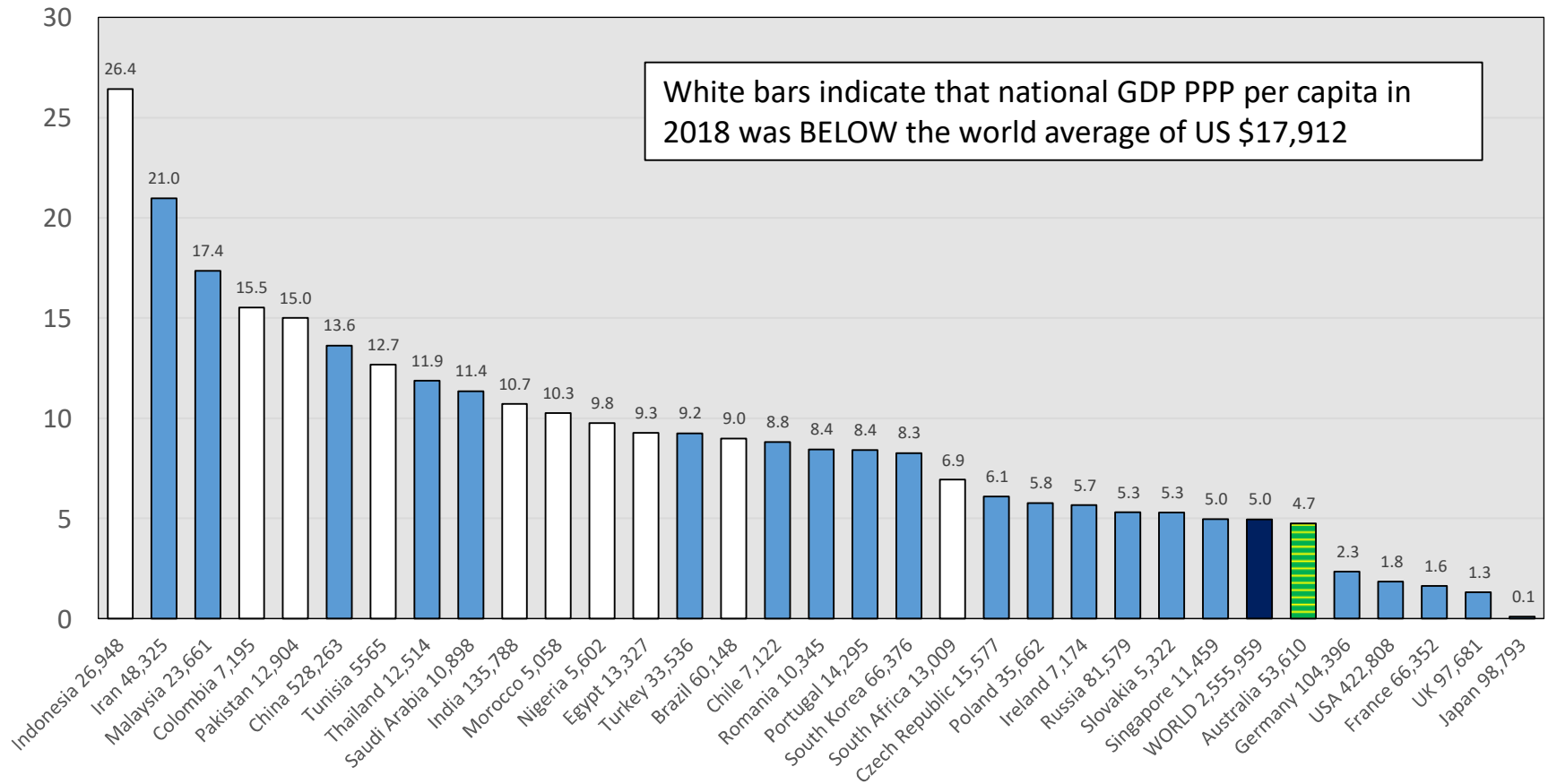
Number of science papers in Scopus by large world region: 1996-2018



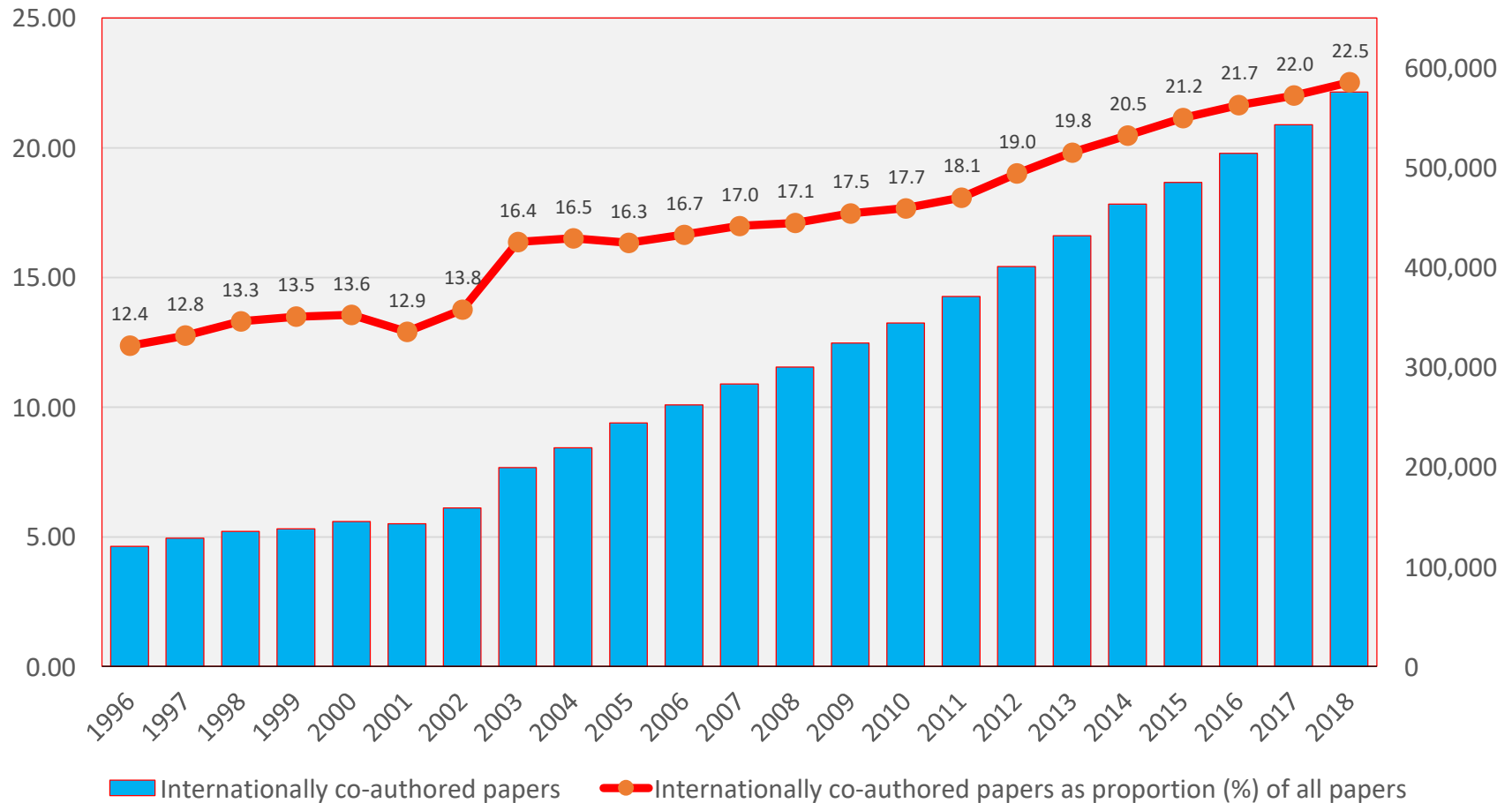
Fastest growing national science systems

Average annual growth (%) in science papers: 2000-2018

Countries with growth rate above the world average of 4.95% per year and producing more than 5000 papers in 2018

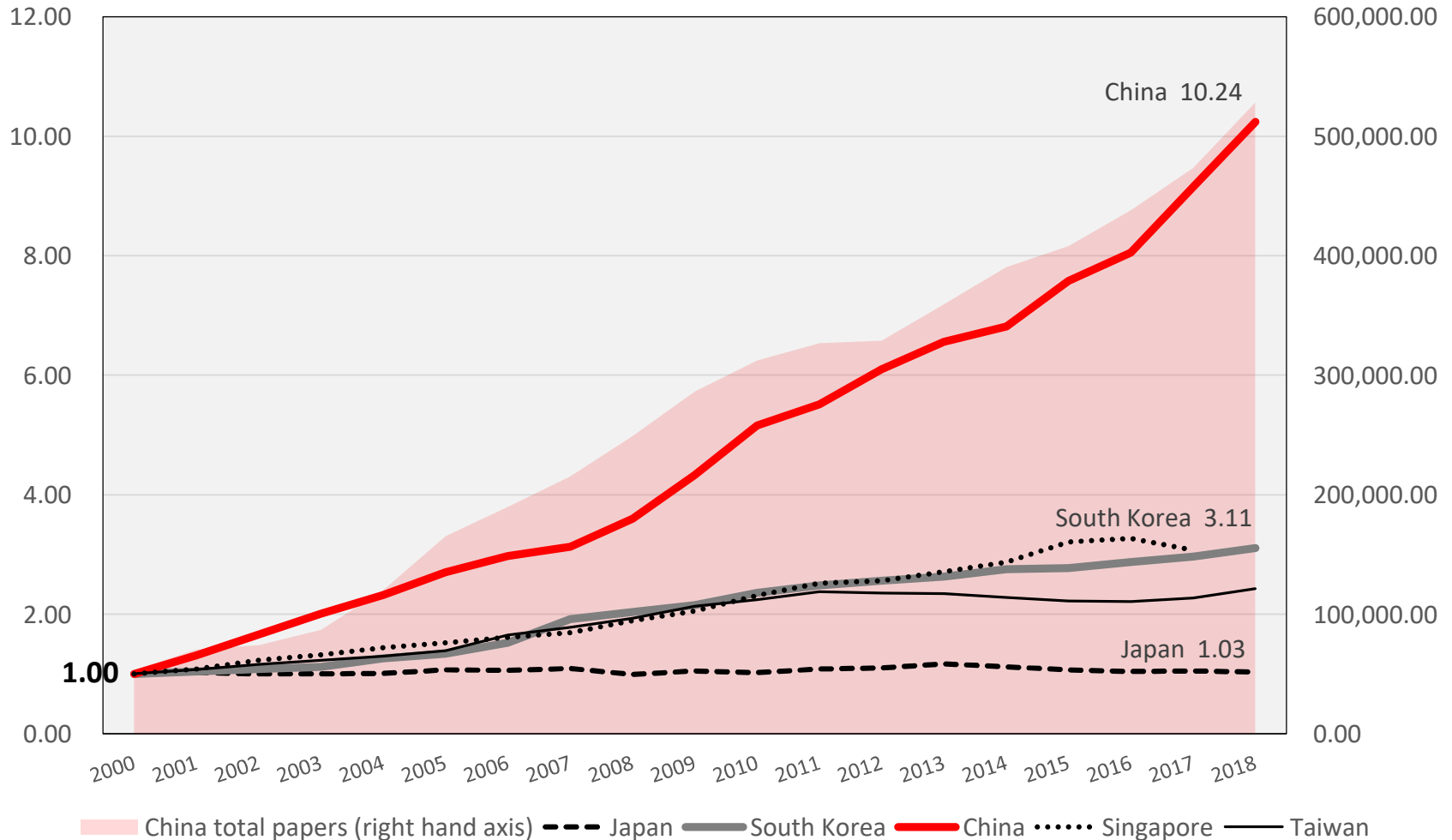


Growth in internationally co-authored science papers, all countries: 1996-2018



Rise of science in East Asia

Growth in R&D in higher education, 1996-2018



Top universities in STEM research

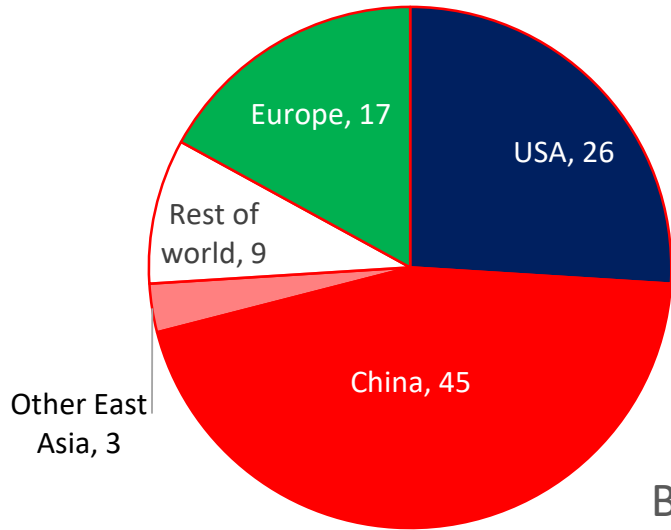
(1) physical sciences and engineering, and (2) mathematics and complex computing, papers in top 5 per cent of their field by citation rate, World: 2015-2018

University	System	Physical sciences & engineering
Tsinghua U	CHINA	830
Massachusetts IT	USA	687
Zhejiang U	CHINA	569
Stanford U	USA	563
Nanyang TU	SINGAPORE	533
Harvard U	USA	532
U Calif., Berkeley	USA	531
U Science & T.	CHINA	500
Harbin IT	CHINA	455
Xi'an Jiaotong U	CHINA	455
Shanghai JT U	CHINA	439
U Cambridge	UK	424
Huazhong U S&T	CHINA	419
ETH Zurich	SWITZERLAND	417

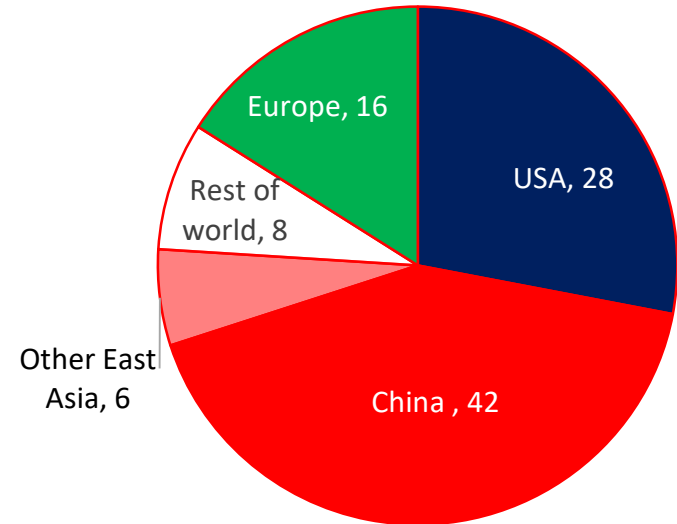
University	System	Maths & computing
Tsinghua U	CHINA	300
Harbin IT	CHINA	252
U Electronic S&T	CHINA	217
Xidian U	CHINA	201
Beihang U	CHINA	197
Zhejiang U	CHINA	197
Huazhong U S&T	CHINA	195
Nanyang TU	SINGAPORE	181
Massachusetts IT	USA	180
Shanghai JT U	CHINA	153
Stanford U	USA	151
Northwestern P. U	CHINA	149
Southeastern U	CHINA	148
NU Singapore	SINGAPORE	140

Leiden ranking

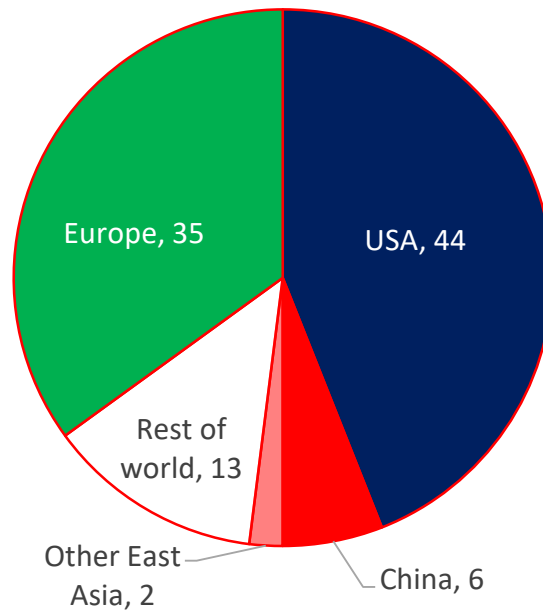
Maths and Computing



Physical Sci and Engineering



Biomedical and Health Sci



**Top 100 universities
on basis of number
of top 5% papers,
2015-2018**

Leiden ranking

Australia's position:

Shanghai ARWU top 10 countries, 2020

	top 100 universities	top 500 universities
United States	45	137
United Kingdom	8	36
Australia	7	23
China (mainland only)	6	71
France	5	17
Switzerland	5	8
Germany	4	30
Canada	4	19
Netherlands	4	12
Japan	3	14

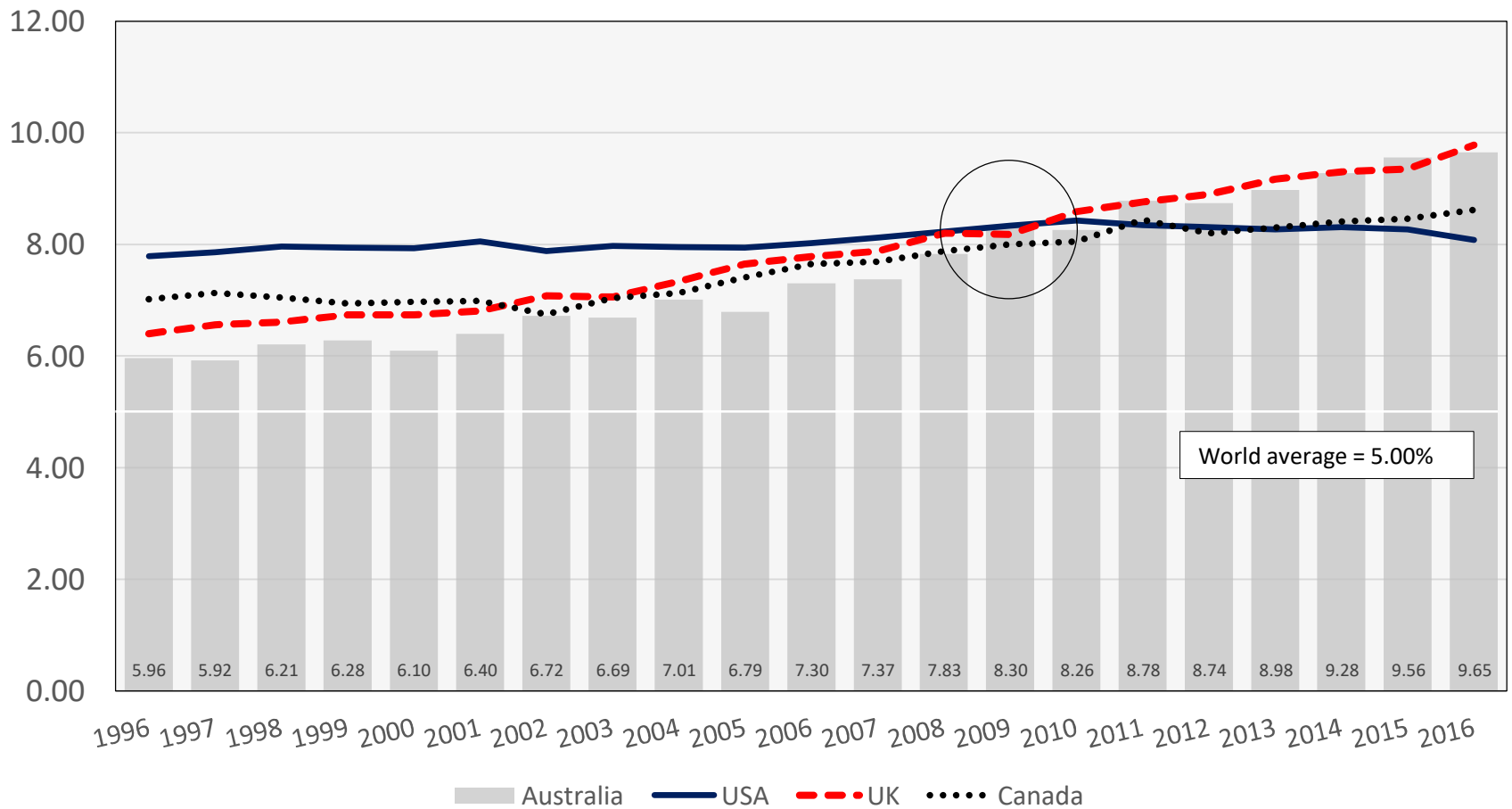
Universities in Shanghai ARWU top 500, 2020

position	universities
1-100	Melbourne (35), Queensland (54), ANU (67), UNSW (74), Sydney (74), Monash (85), Western Australia (85)
101-200	Adelaide (151-200)
201-300	Curtin, Deakin, Macquarie, Swinburne, Tasmania, UT Sydney, Wollongong,
301-400	Griffith, James Cook , La Trobe, Queensland UT, RMIT, Newcastle, Western Sydney
401-500	Flinders

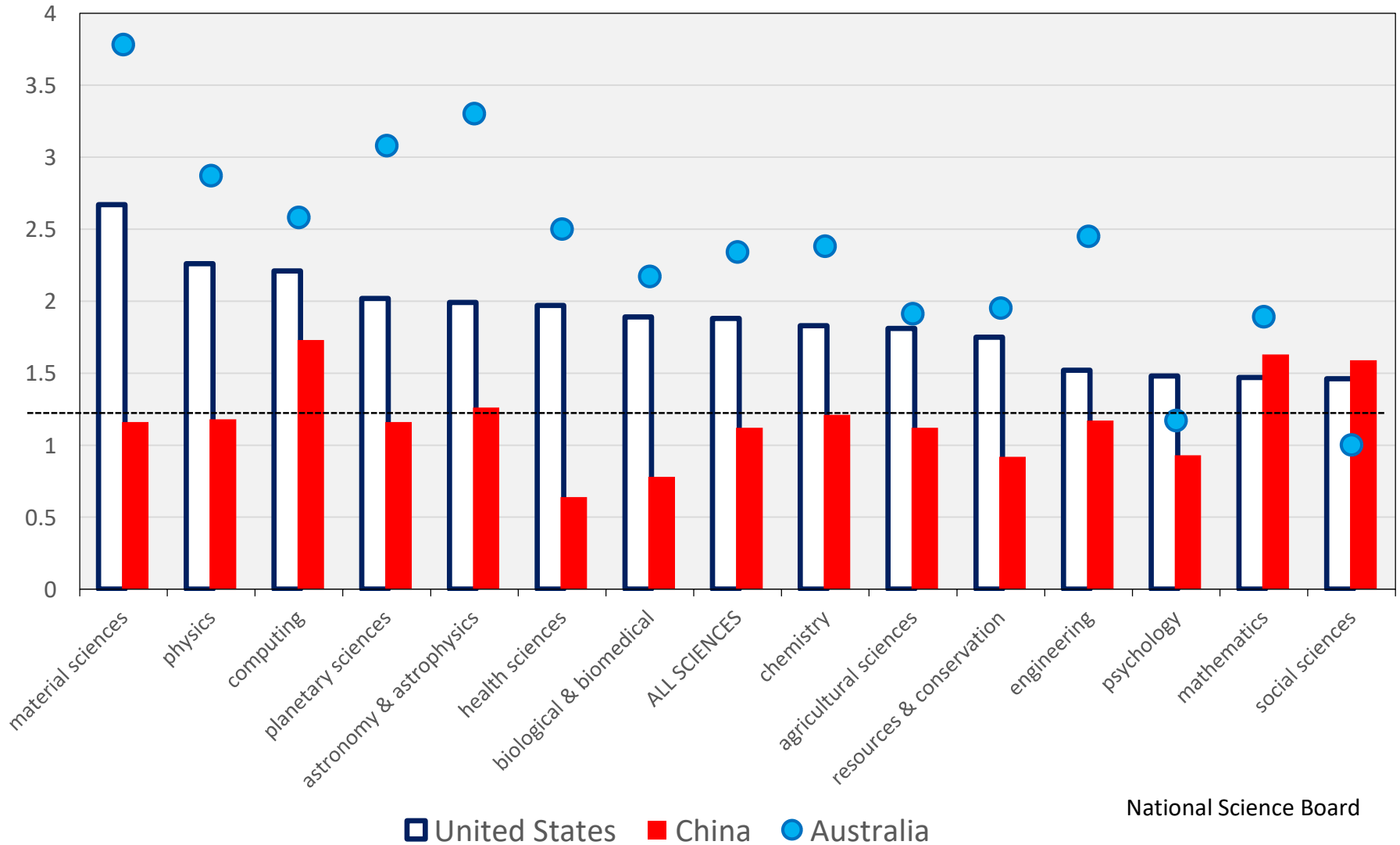
A further 10 Australian universities are ranked between 501 and 1000, so that 33 are ranked altogether. The ARWU is an exclusively research-based ranking

What a 'failed business model' has achieved :

Proportion of science papers in top 5% of their disciplinary field on the basis of citations, Scopus



Proportion (%) of papers in top 1% of their field, US, China and Australia: 2016 (*world average = 1.0*)

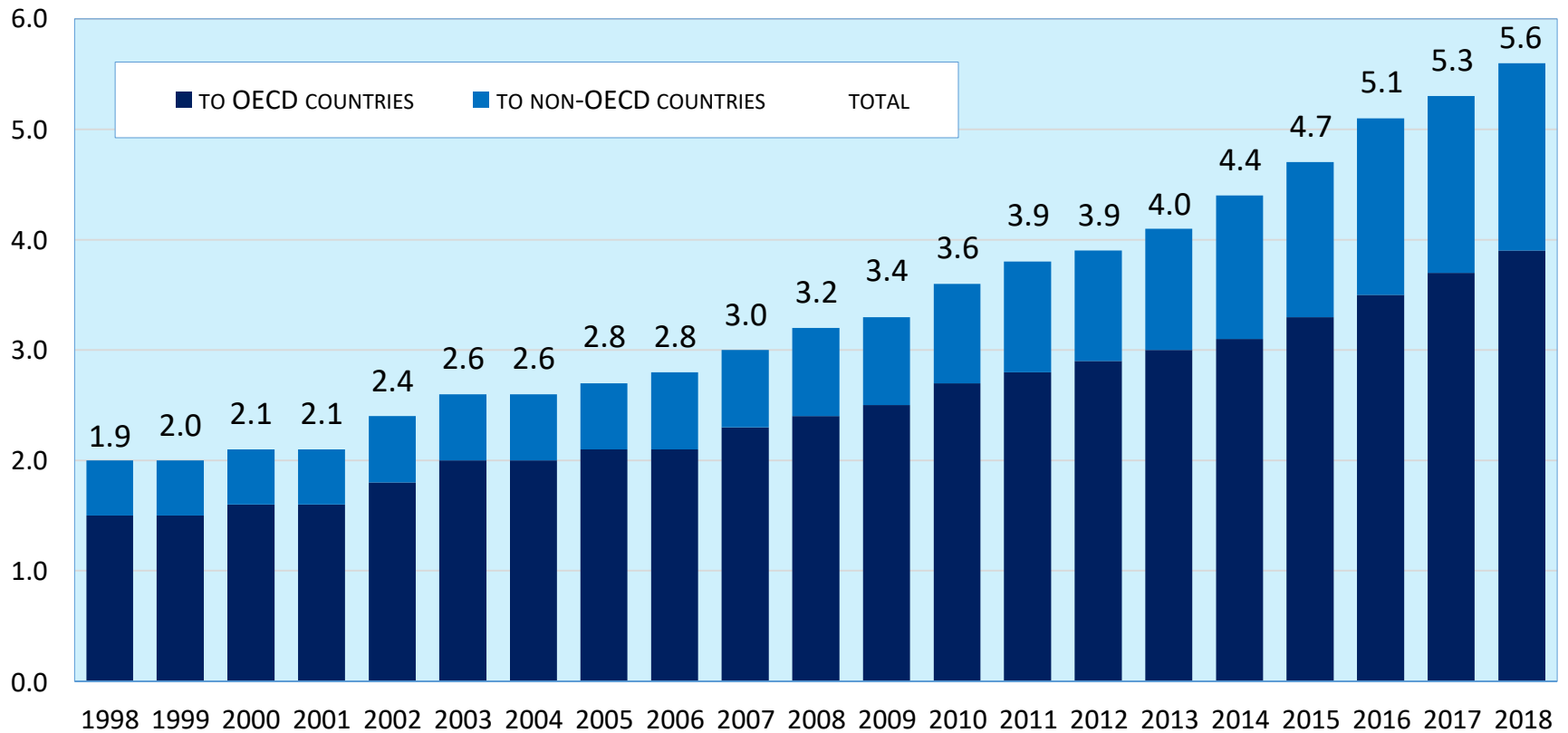


JCU in the global research system

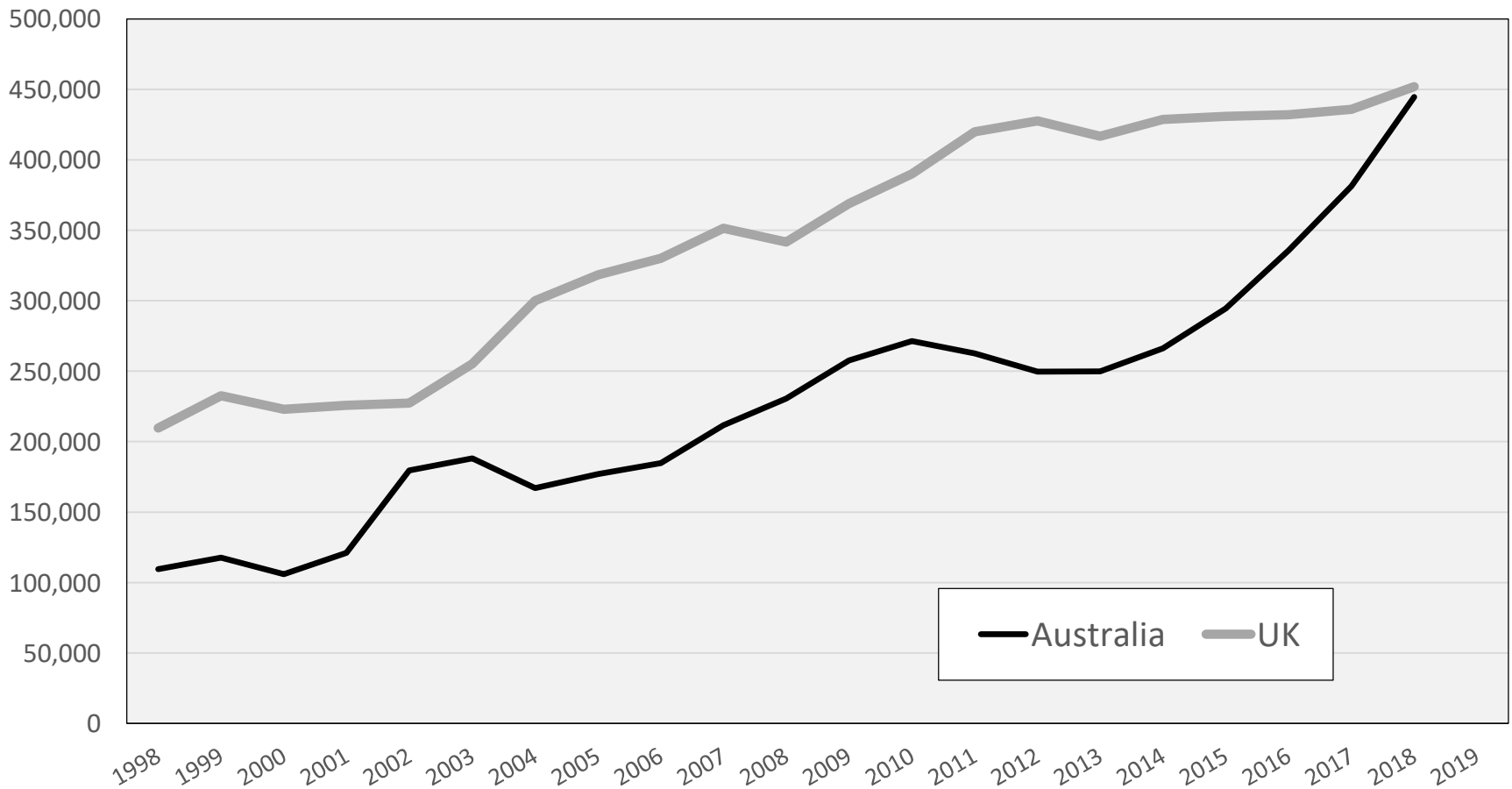
- In world top 400 research universities in ARWU in 2020
- Special strength in 'Life and Earth Sciences' category in Leiden ranking. In high citation papers (top 5% in their field) JCU was fifth in this discipline category in Australia and **64th in the world**, producing 101 such papers in 2015-18
- This compares to 118th position in the world nine years earlier in the first Leiden count, of 2006-2009 papers
- In 2015-18, 8.8% of JCU's papers in Earth and Life Sciences were in the top 5% by citations – highest rate of any Australian university using this quality measure
- Of JCU's 2827 papers in Life and Earth Sciences in 2015-18, 1810 of them (**64.0%**) involved **international collaborations**

2. THE PANDEMIC AND INTERNATIONAL STUDENT MOBILITY

International/ foreign students in tertiary education, worldwide numbers, 1998-2018 (millions) OECD data 2020

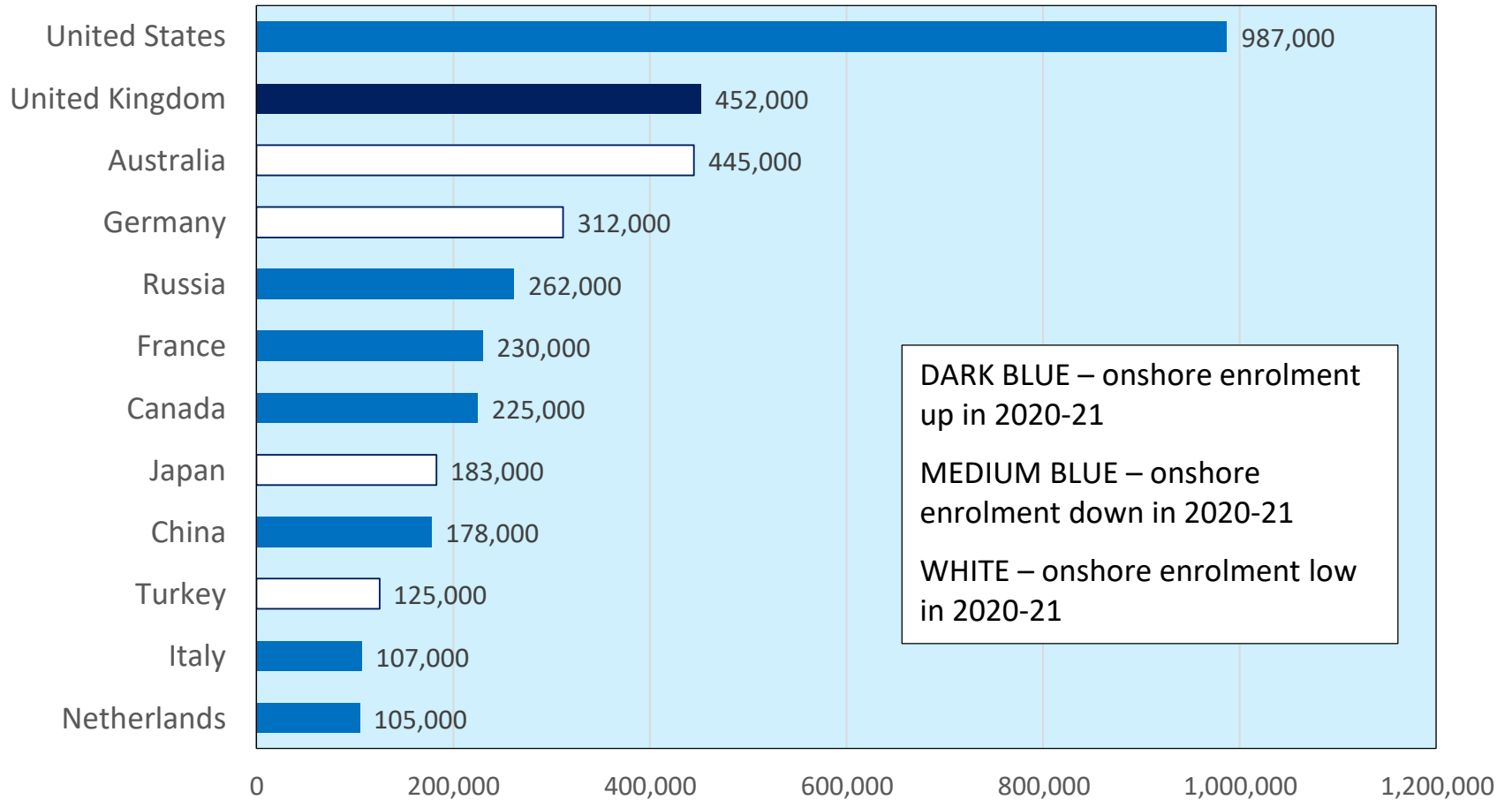


International students, UK and Australia, 1998-2018



Data: UNESCO Institute of Statistics

International student mobility in 2020-21 compared to 2018 enrolment numbers



International student mobility affected differently across the world

‘The crisis has affected the safety and legal status of international students in their host country, the continuity of learning and the delivery of course material, and student perception of the value of their degree, all of which could have dire consequences for international student mobility in the coming years’ - OECD, *Education at a Glance 2020*

- **UK** (452,000 students in 2018): has never closed the border though pandemic is rife, this year 2020-21 accepting 7% more non-European international students, growth is in high prestige universities
- **US** (987,000 in 2018), 43% drop in new enrolments in 2020-21
- Inward plane travel is partly or largely blocked into **Australia** (445,000 students in 2018), **Germany** (312,000), **Japan** (183,000), **Turkey** (125,000)
- **Germany** international applications down 20%, **Netherlands** down more
- International enrolment impaired in many other countries including **Canada**, **New Zealand**

US campuses are struggling

- In the US more than 100,000 confirmed cases on campus since March including 3000 at the U Georgia, 2000 U Alabama, 2000 U South Carolina
- The main problems are in student residences and student accommodation in university towns, and sudden local spikes in the pandemic are forcing lockdowns and switch to online only
- 24 September figures suggest 2020-21 enrolment is down by 4% including a 16% drop in first-year enrolment; the decline is mostly in community colleges which have seen a drop of 9%, and 23% in first-year enrolment
- International student mobility was down 14% in September and the most recent data report a 43% drop in new enrolments 2020-21



Covid-19 hit amid worsening geo-political rivalry, weakening of multilateral institutions, implosion of national politics, and increasing state controls

1. The pandemic shows that collaboration between nation-states is not solving global problems, but cooperation between research universities works well: they have more common values than do nations
2. The impact of the pandemic in society/economy, and in higher education, is highly differentiated by state policies and political cultures. East Asia and Nordic countries have done well. The differentiating effects between systems will have long term effects. Higher education systems with a public good model of higher education have proven to be stronger in the crisis (Western Europe, East Asia).
3. Financial sustainability of institutions is a major issue in the marketised systems (e.g. Anglophone) and emerging countries (e.g. India and Brazil)

4. The research intensive university, but not all institutional models, has proven fairly robust. However its autonomy is under greater pressure from governments in some countries
5. In higher education, unless there is system collapse, domestic student demand will grow during and after the pandemic. But graduate under-employment and social equity problems will intensify
6. Face to face and online higher education will become more differentiated, emerging as distinct products and in some countries, different tuition prices
7. International student mobility will take at least five years to recover; old demand/supply patterns will prove resilient but with some modification

Where will global student mobility recover best?

- **East Asia** (China, South Korea, Taiwan, Singapore, Japan) and some **European** countries (e.g. Finland, Denmark, Germany) have managed the pandemic best and will spring back in higher education. Their universities have strong government support. All these countries can gain ground in the global student market if they want to increase recruitment
- Despite high Covid-19 death tolls **US and UK** will remain high demand nations (numbers are essentially supply driven, and that will not change); UK will gain short term from low mobility into US but US will spring back after the pandemic, Biden will support international education but question-mark about China
- **Australia** has a lower Covid-19 death toll, but is blocking inward flights. Weaker demand than US/UK, slow recovery to pre-pandemic levels, political tension with China, research decline in future may impact global reputation
- **Canada** looks like a long-term winner. It is offering support measures targeted at students affected by the virus, including additional work rights, and access to unemployment benefits

3. ASIA-PACIFIC GEOPOLITICS AND AUSTRALIAN POLITICS

Changing global landscape

- The world Gross Tertiary Enrolment ratio reached 38% prior to the pandemic and growth may now quicken (recession shelter effect)
- Higher education is growing in all world regions, though graduate under-employment will be a massive issue in many countries
- But global student mobility may take 3-5 years to recover from the pandemic
- The United States remains the world-leading system, especially in research, but is under-funding its public universities and colleges
- Globally the main change has been the spectacular rise of China, South Korea and Singapore in higher education and science, and they have been strengthened in comparative terms in the pandemic period
- Universities and science in Western Europe are stronger than ten years ago
- India, Iran and Brazil are emerging as large, important regional systems and sub-Saharan Africa is beginning to rise
- Geopolitical conflict will increasingly affect higher education

The New Cold War



Will China-US and China-Australia scientific collaboration survive?

- Scientific globalism versus technological nationalism (Lee and Haupt 2020)
- In 2018 scientists from China and the US collaborated on 55,382 jointly authored papers in Scopus. There were *26 times* as many China-US papers in 2018 as in 1996, and by far the largest nation-to-nation collaboration in world science (UK-US was second largest at 28,616)
- 2018 saw 13,939 Australia-US papers – and 13,138 Australia-China papers
- Measures taken by the US to retard exchange and cooperation in science (e.g. visa restrictions, border hostility to doctoral students, pressure to relinquish joint appointments and multiple projects) are strongly opposed by many scientists and university leaders in both countries.
- China, always prone to greater regulation, may start to close up its own scientific internationalisation
- *University autonomy and academic freedom are crucial*, if scientists and universities are to maintain cooperation amid these tensions

Australian higher education has challenges!

From international students as one third of all enrolled students in higher education, to . . .

- In 2019 one third of higher education students were international, almost 500,000, mostly East, Southeast and South Asia, JCU is fortunate, its level of dependence on international students is lower at 15% of all students
- In 2018 *27% of income* of higher education institutions was from international students – and 60% of Australia's research was funded from universities' own resources, mostly revenues from international education. This above all has put seven Australian universities into the ARWU top 100
- Modest pandemic death toll in Australia. But international education has been brought to a halt, with inward flights largely stopped. Massive loss in revenues not compensated for. New government policy package reduces funding rate for *domestic* students by an average of 6%, \$1 billion for research in budget helps but it is not enough especially if only one-off
- Government is in ongoing geo-political dispute with China, has imposed an approval process in relation to universities' China links, has banned selected Chinese scholars, this may impact student market in future

The problem in Australia

It is not primarily about international education, it is about funding of research. Many governments are building world-class science, **no other government** would leave science so dependent on a market, no other would let it deteriorate

“An Australian government economist once told me that there was not much value in doing research in in this country because, given our size, we would always be an innovation importing country: we could just buy-in whatever knowledge we needed, presumably funding the purchase by digging resources out of the ground and selling them.”

- Michael Spence, farewell oration as Vice-Chancellor of University of Sydney, 19 November 2020