Trends in global higher education

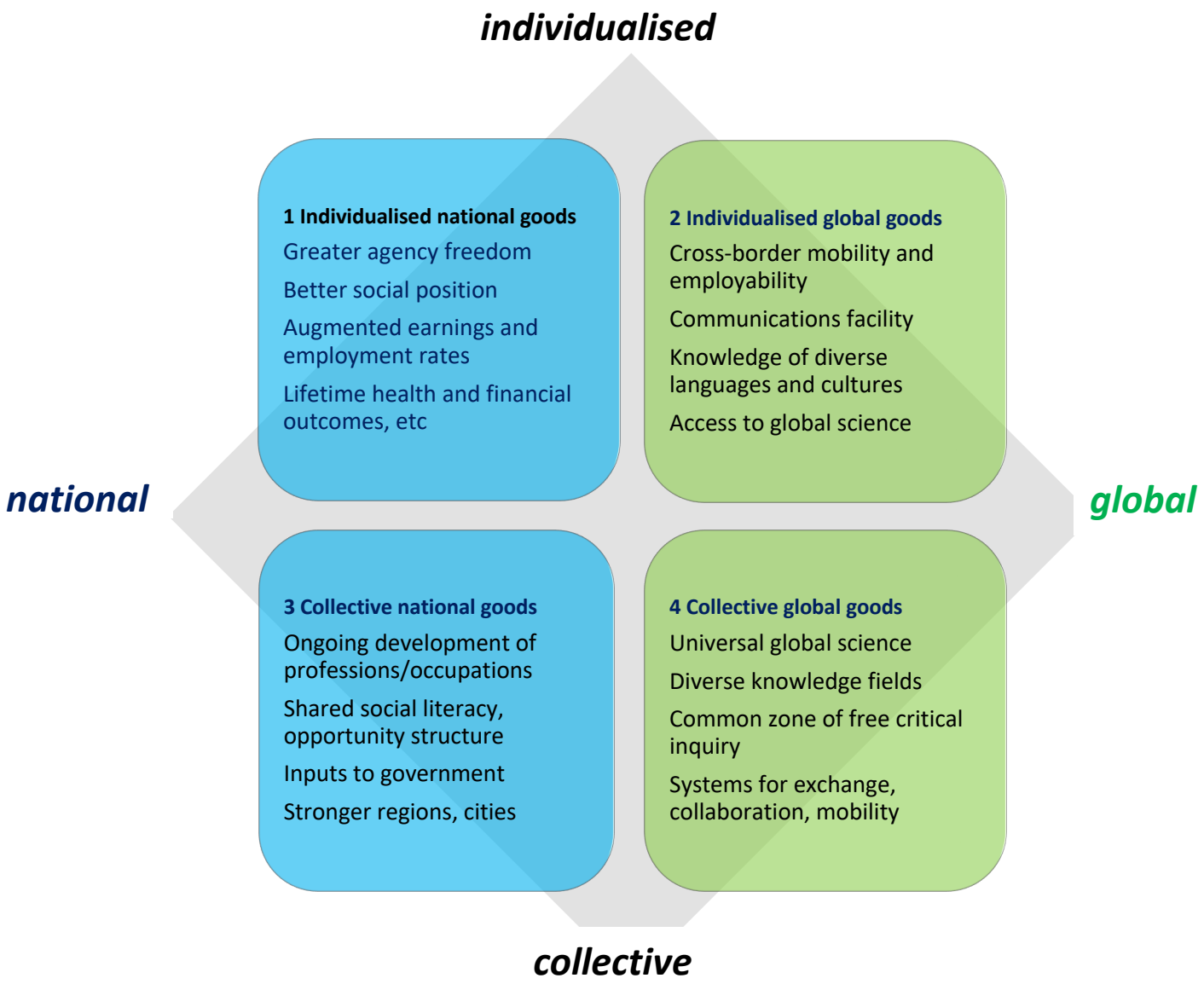
Simon Marginson

ESRC/OFSRE Centre for Global Higher Education
University of Oxford, 18 October 2018

Higher education is . . .

- 220.7 million ‘tertiary’ students worldwide, 51% women
- 176.7 million (80%) in degree programmes
- 23.8 million at Masters level and 3.0 million PhDs
- about 40,000 tertiary institutions in the world of which almost 30,000 are in India, mostly small private colleges
- in some countries only degree granting institutions are ‘higher education’, in others all tertiary institutions are ‘higher’
- about 2500 recognisably research intensive universities, 6% of the total, of which 938 (less than 3% of total) each produced more than 1000 published science papers 2013-2016 inclusive

HE: Individual and collective contributions



How do we think about “global” tendencies?

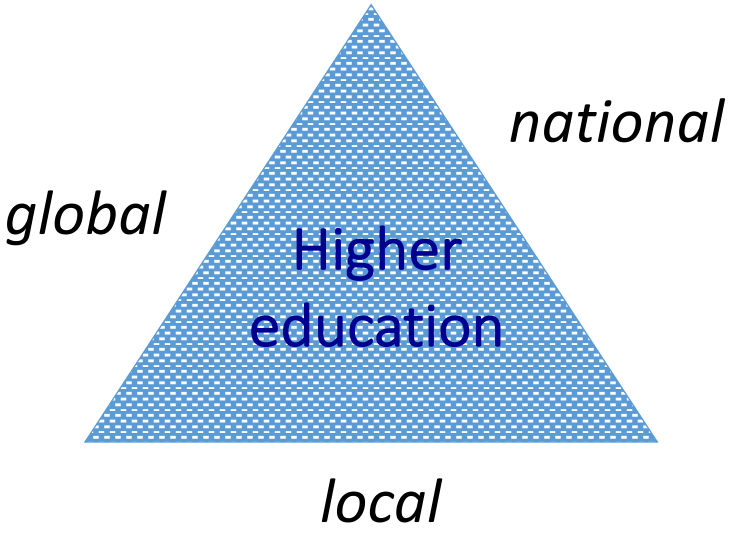
- The global is not a universal container with everything in it (“world”). The global refers to systems, relations and phenomena at planetary or large region level
- “International” is between nations, inter-national
- International and global relations are often marginalised. “Methodological nationalism”, the assumption the nation is the spatial horizon of meaning (Shajahan and Kezar, 2013)
- On the other hand, some global analysis unduly prioritises cross-border connections and flows
- Arguably, the ”glonacal” perspective captures more than either

Shahjahan, R. and Kezar, A. (2013). Beyond the ‘national container’: Addressing methodological nationalism in higher education research. *Educational Researcher*, 42 (1), pp. 20-29

Marginson, S. and Rhoades, G. (2002). Beyond national states, markets, and systems of higher education: A glonacal agency heuristic. *Higher Education*, 43 (3), 281-309

Glonacal positionality in higher education (global, national, local at the same time)

- Higher education is formed, regulated and practiced in *national (*and also in Europe pan-national regional) systems
- *Local* activities are important to all institutions
- *Global* activities are increasingly obvious, especially but not only in research universities
- (On a good day) institutional strategy synchronises local, national and global
- Creates demanding KPIs for institutional leaders and staff
- Institutions vary in their emphasis, in their mix between local, national and global

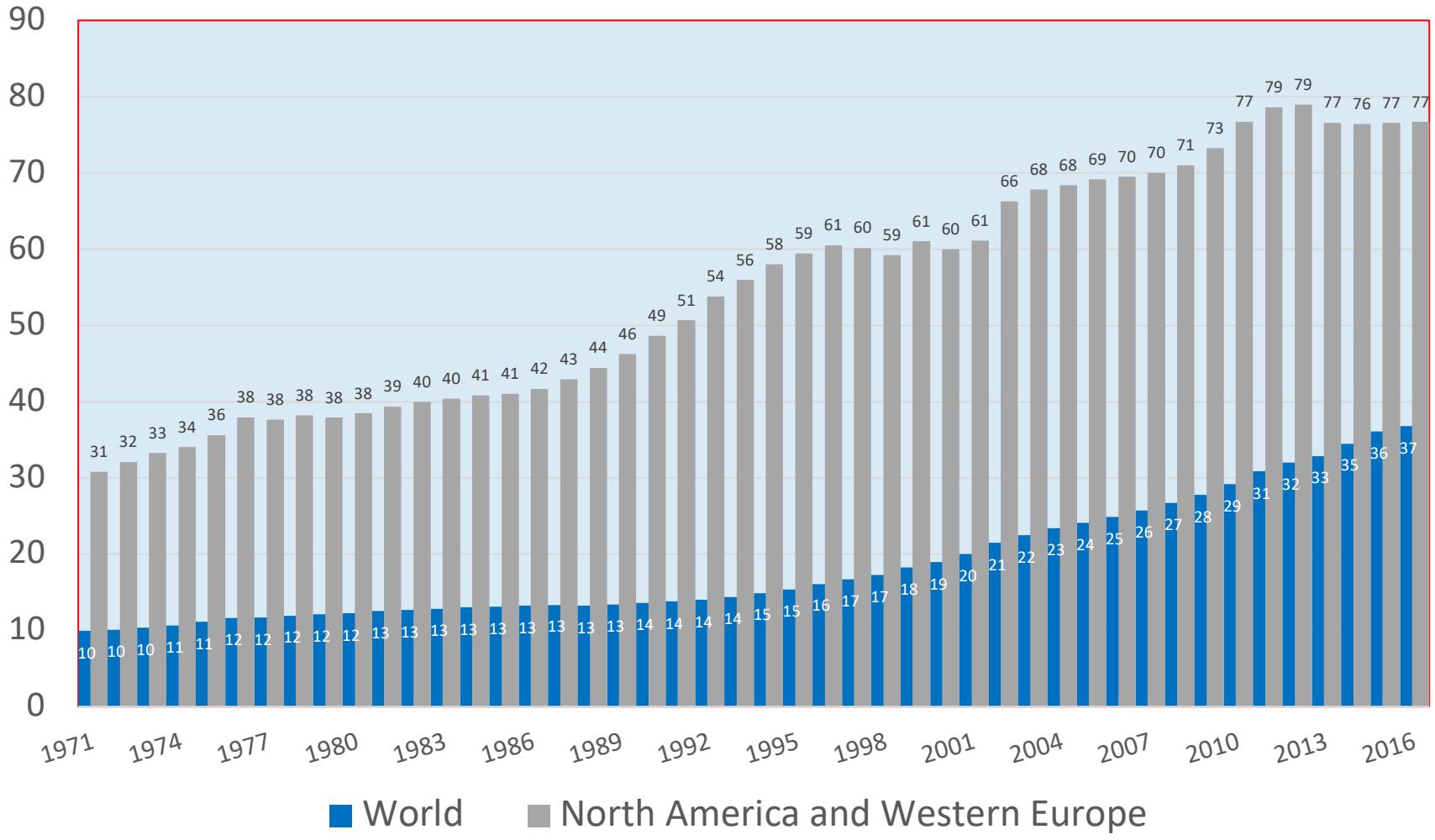


Factors shaping higher education 1: Global tendencies

- Worldwide growth of higher education and emergence of ‘high participation society’

Gross Enrolment Ratio tertiary education (%)

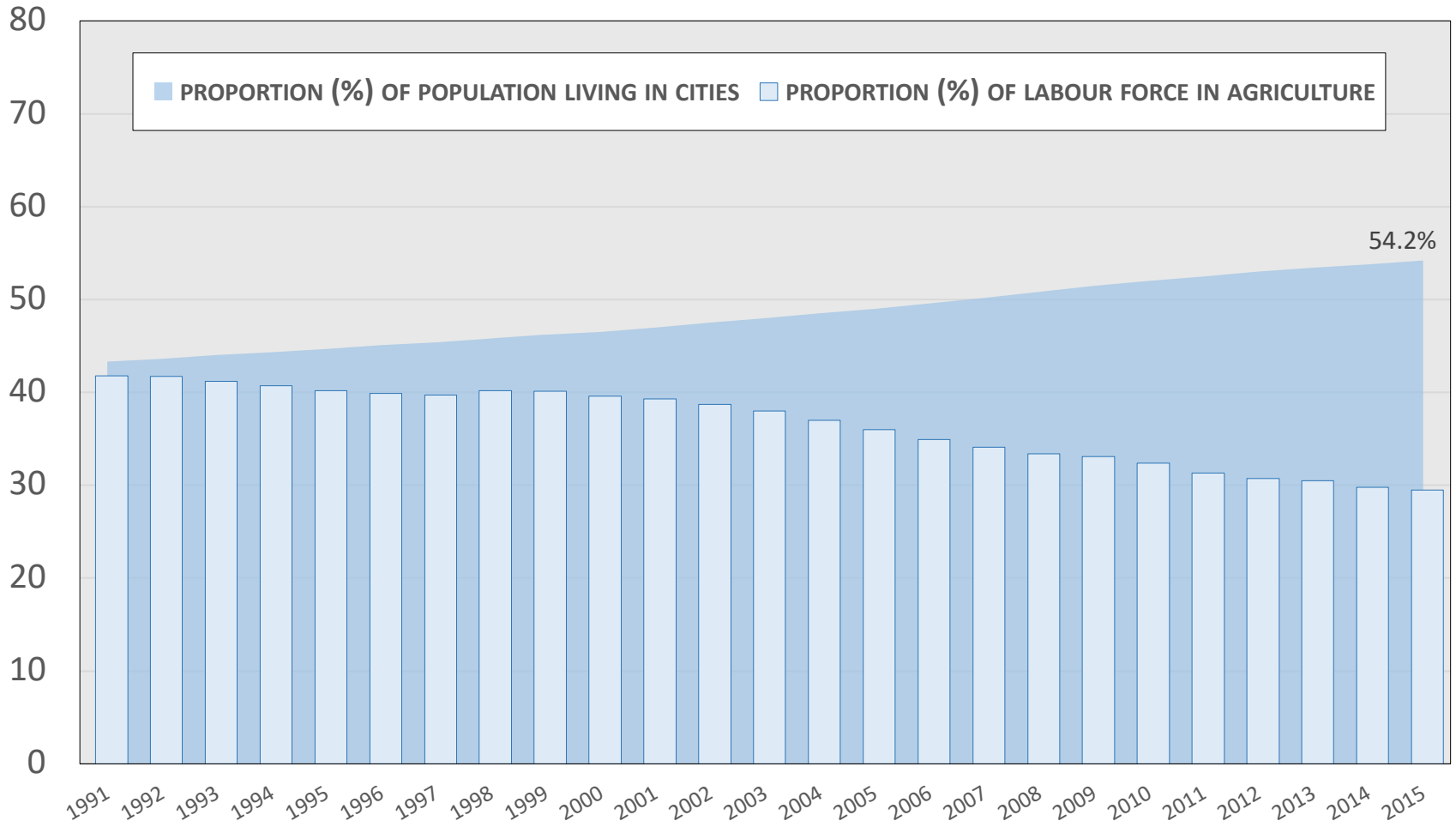
World, North America/Western Europe: 1971-2016



World regional Gross Tertiary Enrolment Ratios (%): 1970, 1990, 2010 and 2014

	1970 (%)	1990 (%)	2010 (%)	2014 (%)
World	10.0	13.6	29.3	34.5
North America/ W. Europe	30.6	48.6	76.9	76.4
Central and Eastern Europe	30.2	33.9	67.9	74.4
Latin America and Caribbean	6.9	16.9	40.9	44.7
East Asia and Pacific	2.9	7.3	27.3	39.1
Arab States	6.0	11.4	25.5	28.9
Central Asia	n.a.	25.3	26.7	25.7
South and West Asia	4.2	5.7	17.4	22.8
Sub-Saharan Africa	0.9	3.0	7.7	8.2

World urban population (%) and proportion of labour force in agriculture (%) : 1991-2015



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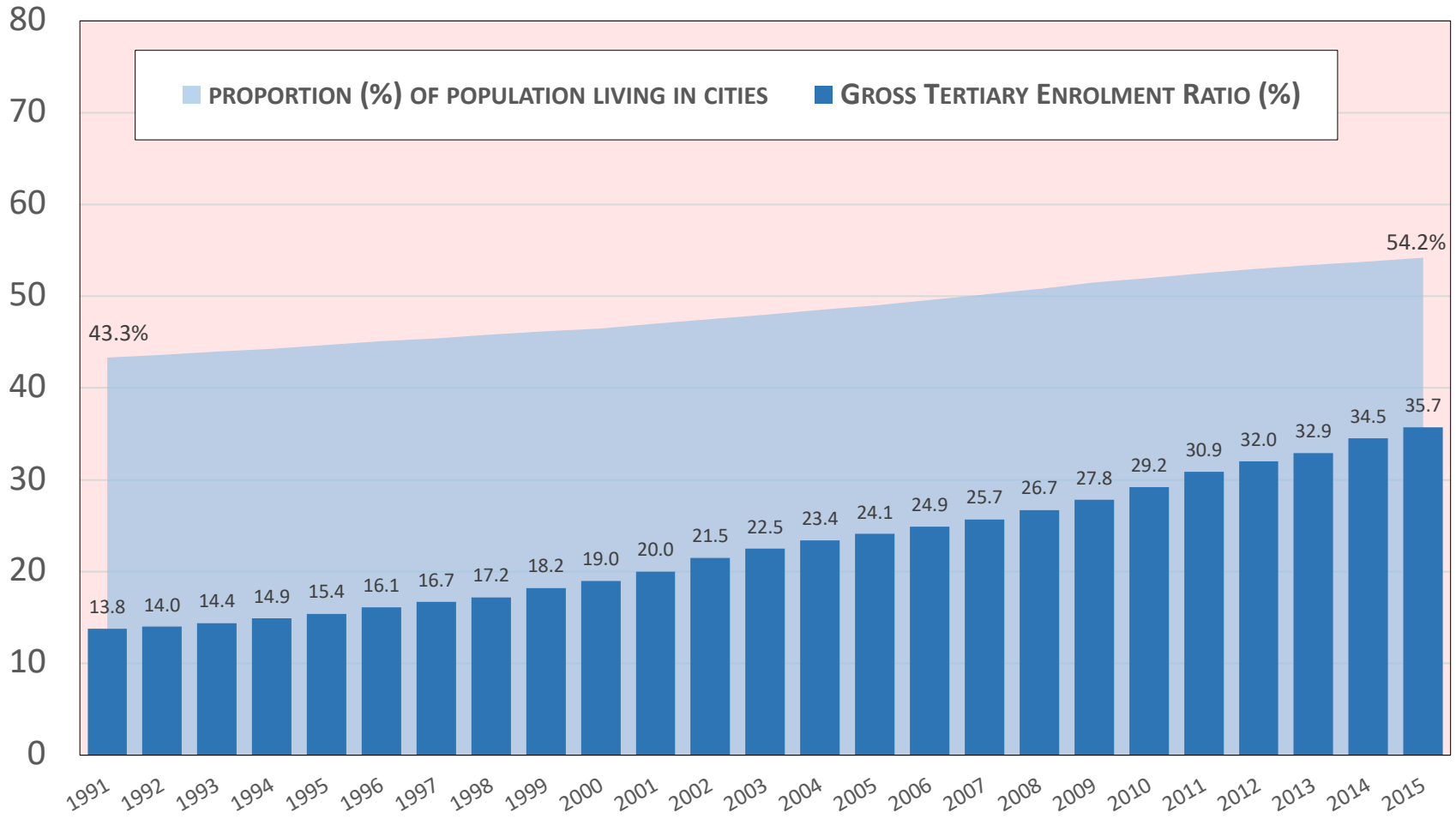
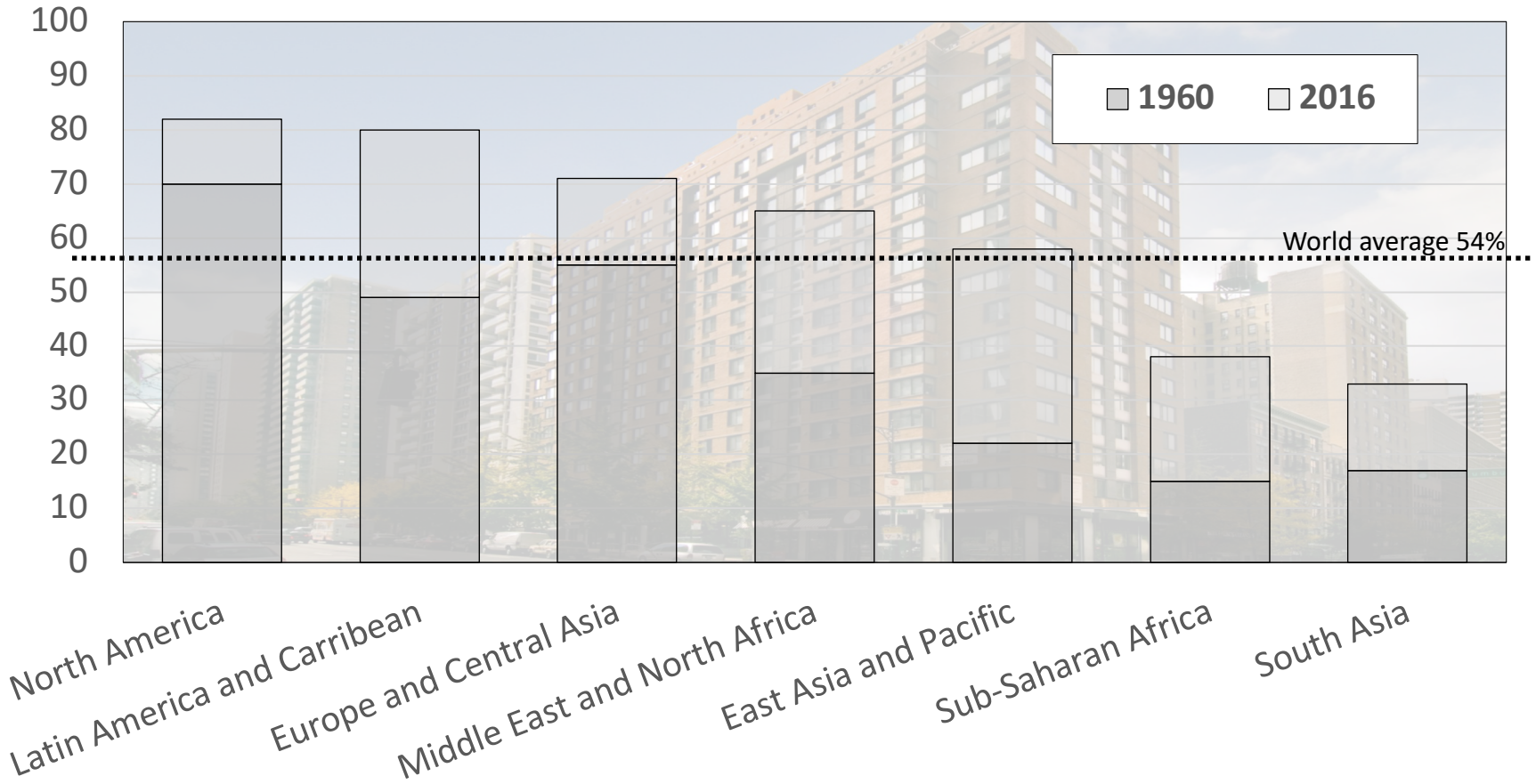


Factors shaping higher education 1: Global tendencies

- Worldwide growth of higher education and emergence of ‘high participation society’
- Urbanisation, global cities and higher education

Proportion of people living in cities (%), by world region: 2016



OXFORD

HIGH PARTICIPATION SYSTEMS OF HIGHER EDUCATION

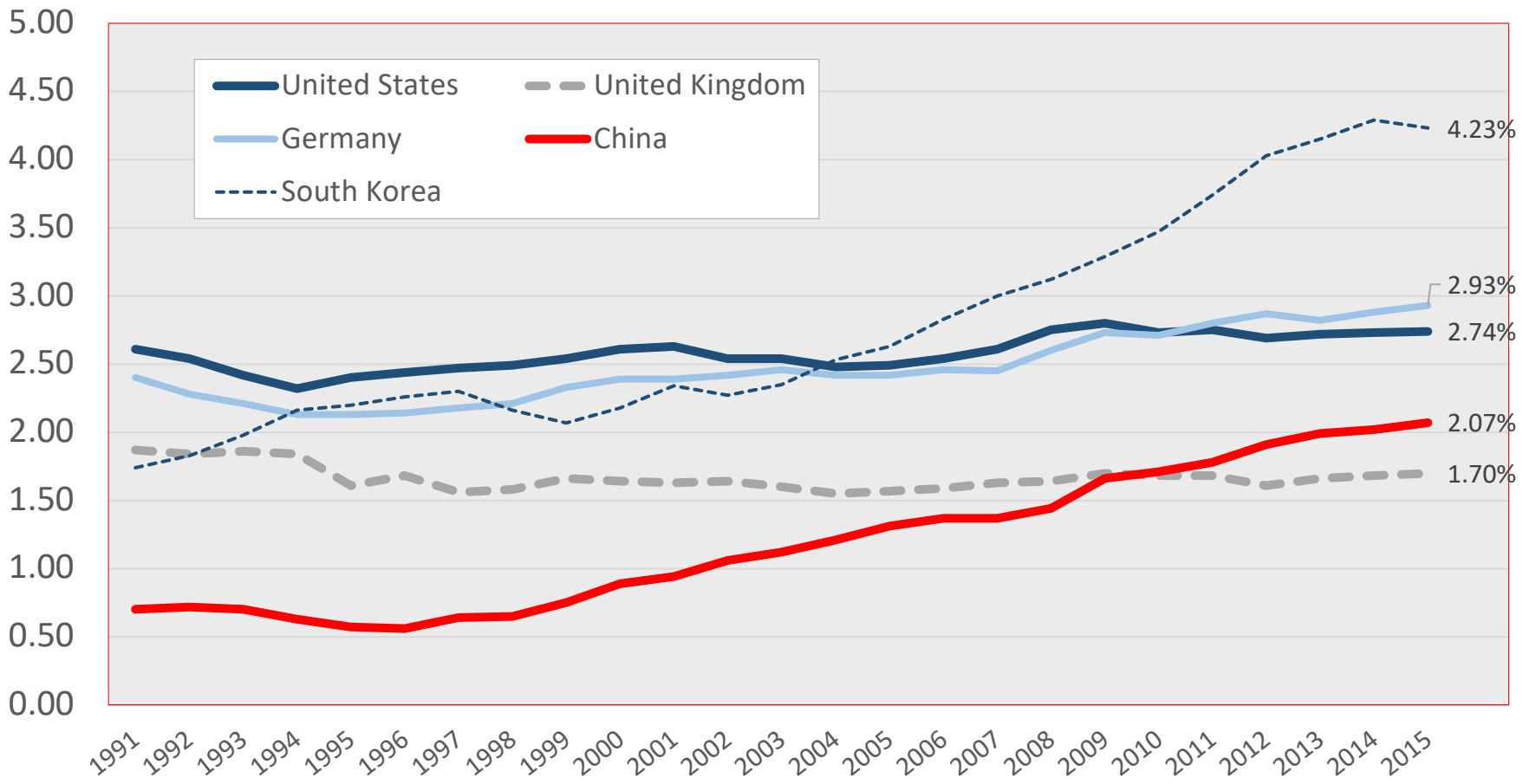
Edited by

BRENDAN CANTWELL
SIMON MARGINSON
ANNA SMOLENTSEVA

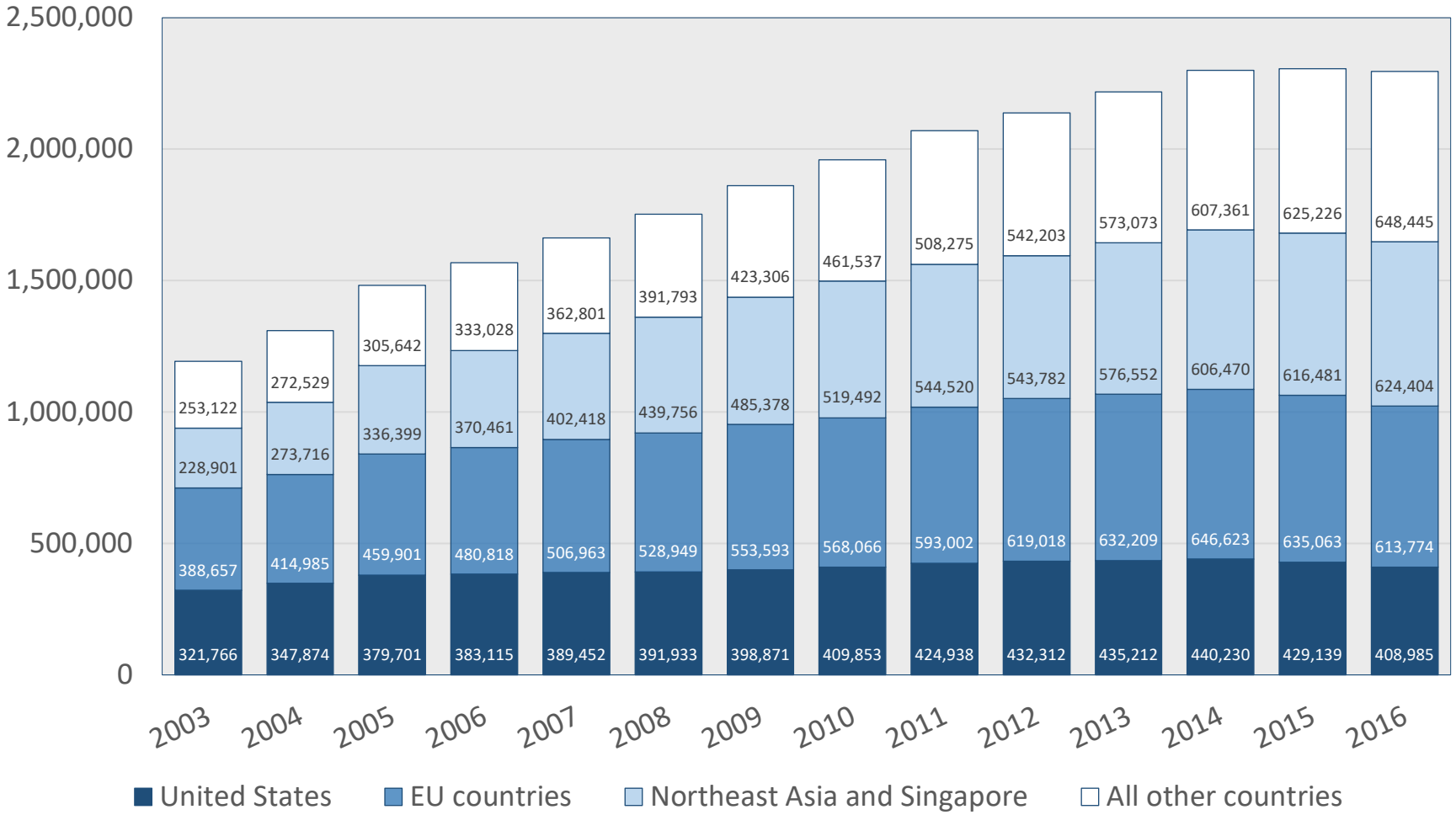
Factors shaping higher education 1: Global tendencies

- Worldwide growth of higher education and emergence of ‘high participation society’
- Urbanisation, global cities and higher education
- Growth and spread of science and research

R&D as a proportion (%) of GDP, USA, UK, Germany, China, South Korea: 1991-2015



Number of science papers, USA, Europe, East Asia and Singapore, rest of world: 2003-2014



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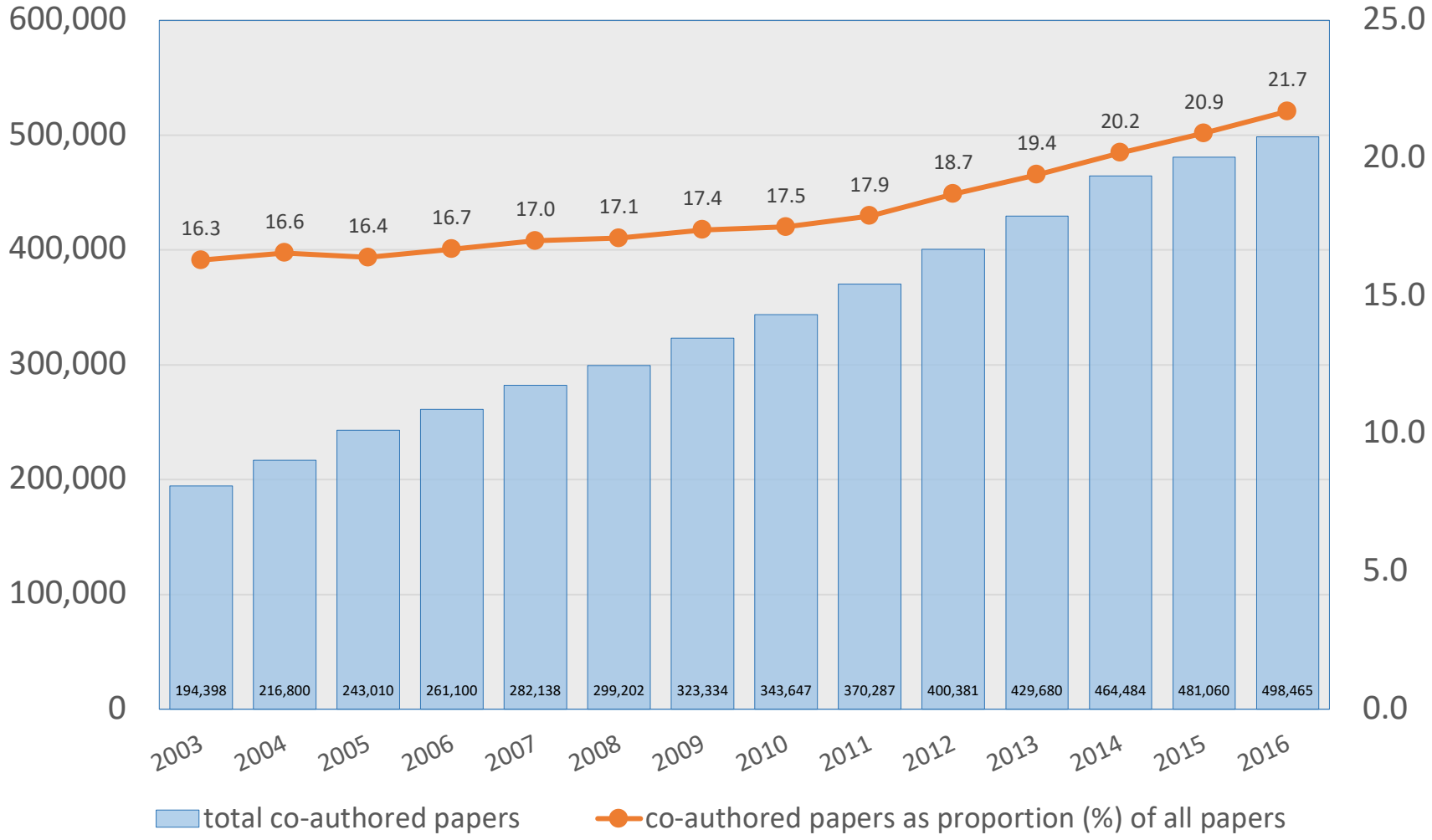
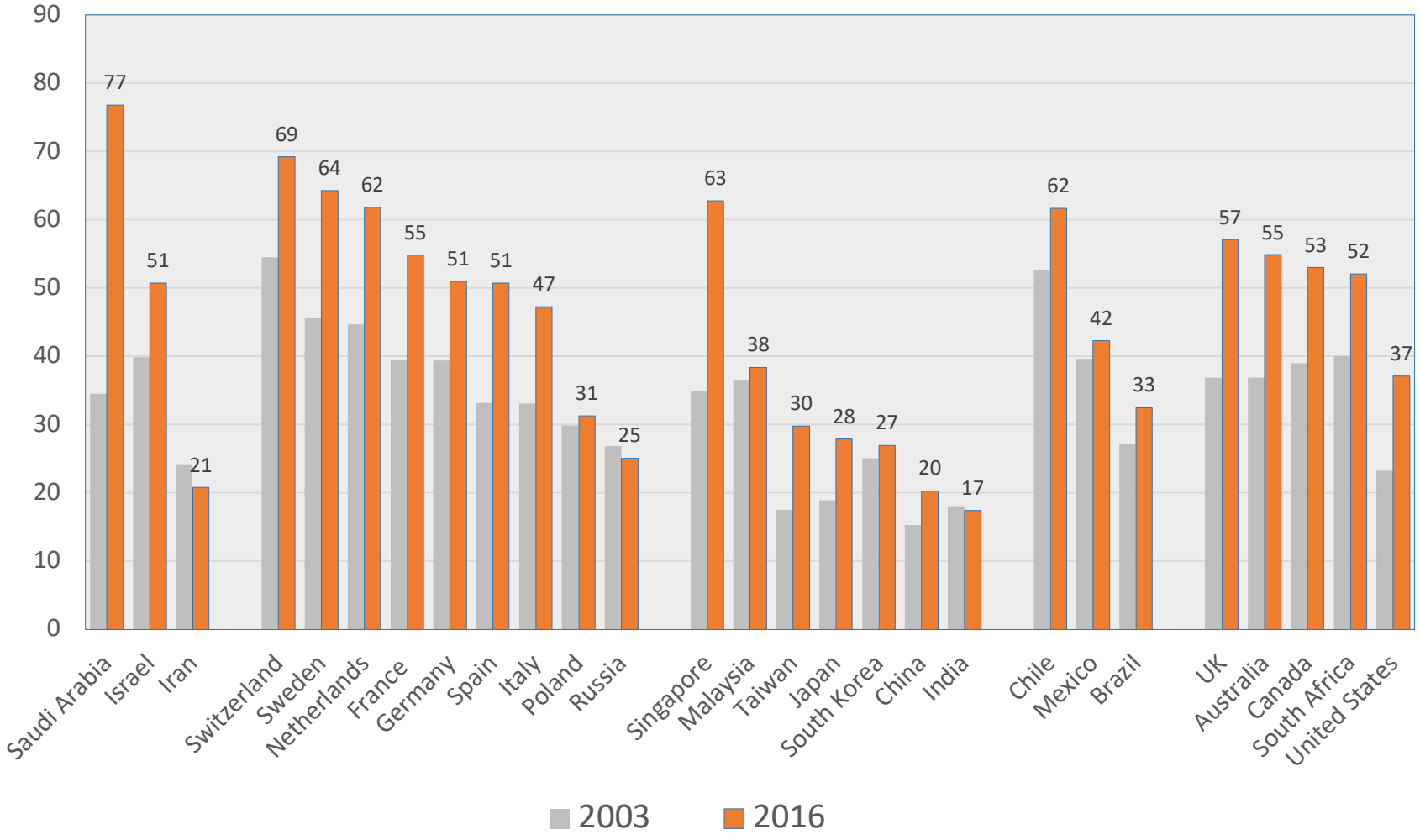
- Global research collaboration

Growth in internationally co-authored papers, all countries: 2003-2016



Percentage of all papers internationally co-authored, selected countries: 2003 and 2016



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WCUs: World's largest science universities

University and country	Number of papers 2013-16	Papers in top 10% by cite rate	Papers in top 1% by cite rate
Harvard U UNITED STATES	33,045	7305	1096
U Toronto CANADA	22,151	3088	326
Zhejiang U CHINA	20,876	2005	162
Shanghai Jiao Tong U CHINA	20,406	1773	129
U Michigan UNITED STATES	13,348	2806	308
Tsinghua U CHINA	16,929	2120	201
Johns Hopkins U UNITED STATES	16,831	2698	337
U Sao Paulo BRAZIL	16,120	955	75
Seoul National U SOUTH KOREA	15,468	1217	90
Stanford U UNITED STATES	15,364	3441	533
Peking U CHINA	15,182	1543	148
U Tokyo JAPAN	14,893	1401	133
U Oxford UNITED KINGDOM	14,505	2732	354
U Washington UNITED STATES	14,446	2429	313
U College London UNITED KINGDOM	14,203	2532	325

WCUs: Those with most high citation papers

University and country	Papers in top 1% by cite rate	Papers in top 10% by cite rate	% of all papers in top 10%
Harvard U UNITED STATES	1096	7305	22.1%
Stanford U UNITED STATES	533	3441	22.4%
MIT UNITED STATES	429	2616	25.1%
UC Berkeley UNITED STATES	355	2557	21.6%
U Oxford UNITED KINGDOM	354	2732	18.8%
Johns Hopkins U UNITED STATES	337	2698	16.0%
U Cambridge UNITED KINGDOM	334	2407	18.4%
U Toronto CANADA	326	3088	13.9%
U College London UNITED KINGDOM	325	2532	17.8%
U Washington UNITED STATES	313	2429	16.8%
U Michigan UNITED STATES	308	2806	15.3%
UC Los Angeles UNITED STATES	302	2366	17.2%
Yale U UNITED STATES	290	2129	18.9%
U Pennsylvania UNITED STATES	288	2335	17.6%
U Columbia UNITED STATES	273	2192	17.9%

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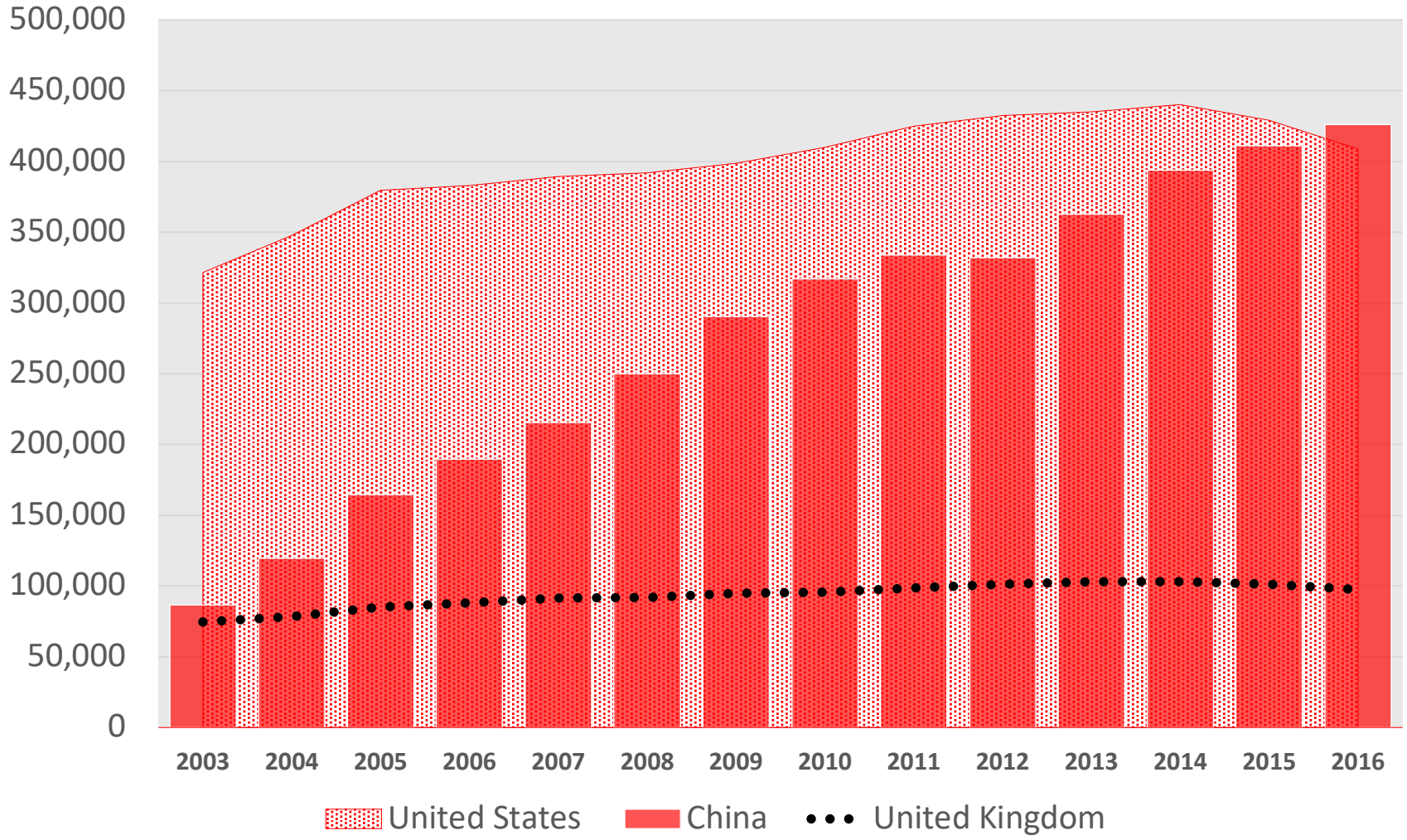
Trends in global income inequality
Theil index: 1990-2010

(a fall in the Theil index indicates that inequality is reducing)

	1990	1995	2000	2005	2010
Global inequality	0.949	0.918	0.903	0.827	0.723
Inequality between countries	0.734	0.696	0.681	0.600	0.479
Inequality within countries	0.215	0.222	0.222	0.227	0.244

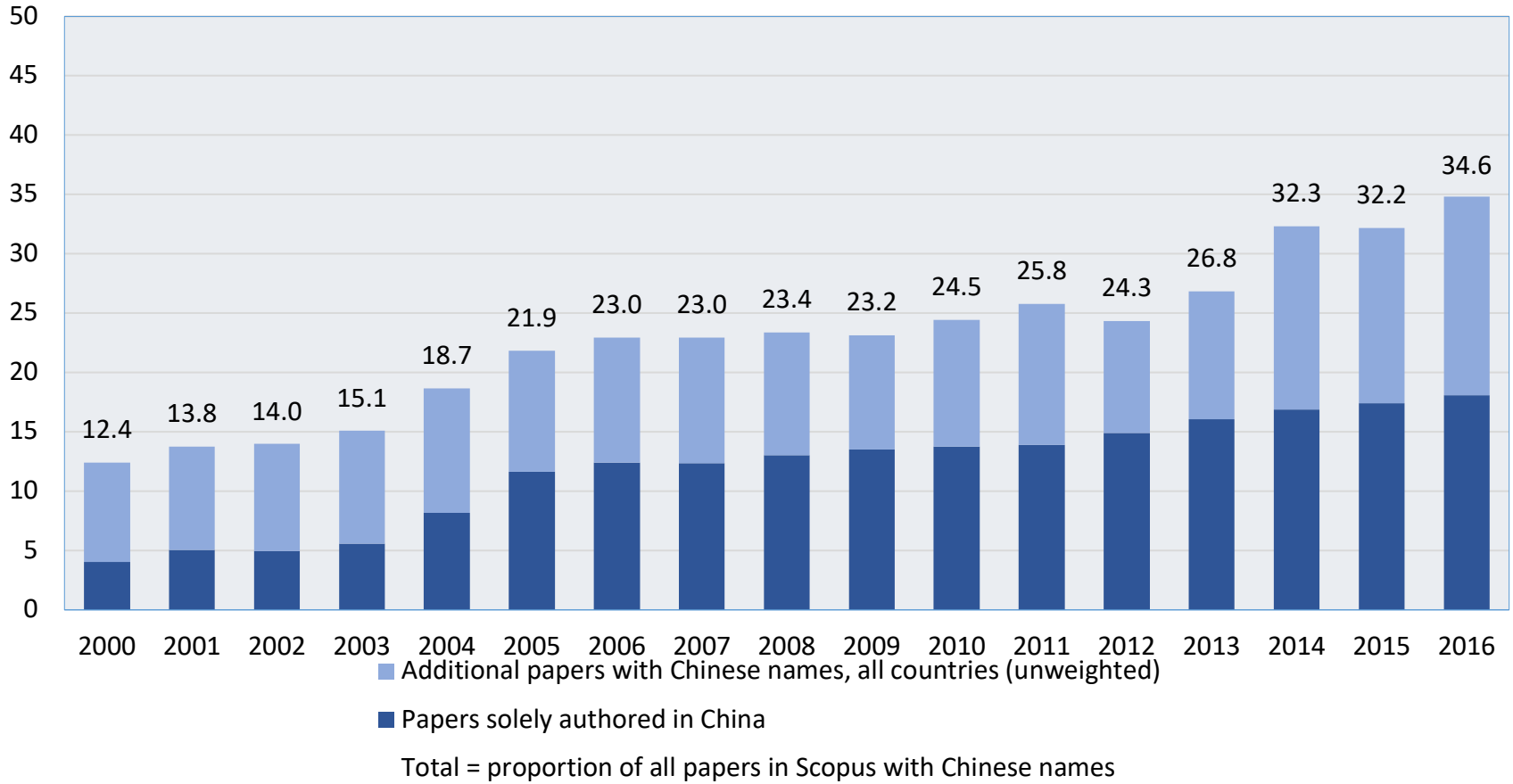
F. Bourguignon, *The Globalisation of Inequality*, Oxford University Press, Oxford, 2015, p. 42

US National Science Board data, number of research papers, USA, China, UK: 2003-2016



Growth of China-associated science papers

Proportion (%) of total worldwide papers in Scopus: 2000-2016



World's top 10 universities in all Physical Sciences STEM, high citation papers, 2013-16

University	System	Top 10% papers in Physical Sciences, Engineering, Maths , Computing
Tsinghua U	CHINA	1702
Massachusetts IT	USA	1462
UC Berkeley	USA	1309
Zhejiang U	CHINA	1232
Nanyang TU	SINGAPORE	1224
Stanford U	USA	1159
NU Singapore	SINGAPORE	1001
Harvard U	USA	988
Shanghai JT U	CHINA	966
U Cambridge	UK	962

University	System	Top 1% papers in Physical Sciences, Engineering, Maths, Computing
Massachusetts IT	USA	214
Stanford U	USA	197
UC Berkeley	USA	174
Harvard U	USA	160
Tsinghua U	CHINA	159
Nanyang TU	SINGAPORE	148
U Cambridge	UK	130
NU Singapore	SINGAPORE	108
Caltech	USA	106
EPF Lausanne	SWITZERLAND	106

World's leading universities in high citation (top 10%) papers in Physical Sciences STEM, 2013-16

University	System	Top 10% papers in Physical Sciences & Engineering
Tsinghua U	CHINA	1269
Massachusetts IT	USA	1201
UC Berkeley	USA	1126
Nanyang TU	SINGAPORE	949
Stanford U	USA	937
Zhejiang U	CHINA	936
Harvard U	USA	878
U Cambridge	UK	827
U S & T	CHINA	801
NU Singapore	SINGAPORE	771
Shanghai JT U	CHINA	733
ETH Zurich	SWITZERLAND	687
U Tokyo	JAPAN	682
Peking U	CHINA	675
Xi'an Jiatong U	CHINA	665
Imperial C Lon	UK	663

University	System	Top 10% papers in Mathematics & Computing
Tsinghua U	CHINA	432
Zhejiang U	CHINA	296
Harbin IT	CHINA	281
Nanyang TU	SINGAPORE	275
Xidian U	CHINA	273
Huazhong UST	CHINA	267
Massachusetts IT	USA	261
U Electronic S&T	CHINA	244
Shanghai Jiao T U	CHINA	233
NU Singapore	SINGAPORE	230
South East U	CHINA	226
Stanford U	USA	222
Beihang U	CHINA	219
City U Hong Kong	HONG K SAR	199
U Texas, Austin	USA	187
ETH Zurich	SWITZERLAND	187

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University	System	Top 1% papers in Physical Sciences & Engineering
Massachusetts IT	USA	179
Stanford U	USA	159
UC Berkeley	USA	144
Harvard U	USA	139
Tsinghua U	CHINA	117
Nanyang TU	SINGAPORE	116
U Cambridge	UK	109
Caltech	USA	96
EPF Lausanne	SWITZERLAND	91
U S & T	CHINA	88
U Michigan	USA	84
ETH Zurich	SWITZERLAND	79
NU Singapore	SINGAPORE	79
Imperial C Lon	UK	78
Zhejiang U	CHINA	77
Northwestern U	USA	76

University	System	Top 1% papers in Mathematics & Computing
Tsinghua U	CHINA	42
Stanford U	USA	38
Harbin IT	CHINA	38
Massachusetts IT	USA	35
Nanyang TU	SINGAPORE	32
UC Berkeley	USA	30
U Electronic S&T	CHINA	29
NU Singapore	SINGAPORE	29
City U Hong Kong	HONG K SAR	28
Huazhong UST	CHINA	28
U Texas, Austin	USA	28
South East U	CHINA	27
Zhejiang U	CHINA	24
Princeton U	USA	24
UC Los Angeles	USA	24
Shanghai JTU	CHINA	21

World's leading universities in high citation (top 10%) papers in Biomedical, Life/Earth Sciences, 2013-16

University	System	Top 10% papers in Biomedical and Health Sciences
Harvard U	USA	5171
Johns Hopkins U	USA	2081
U Toronto	CANADA	1962
UC San Francisco	USA	1706
Stanford U	USA	1555
U College London	UK	1532
U Pennsylvania	USA	1507
U Michigan	USA	1498
U Washington Se.	USA	1333
U Oxford	UK	1256
Yale U	USA	1222
Columbia U	USA	1219
U Pittsburg	USA	1217
U Texas HSC Hou.	USA	1210
UC Los Angeles	USA	1200
UC San Diego	USA	1153

University	System	Top 10% papers in Life and Earth Sciences
Wageningen U	NETHERLANDS	483
Harvard U	USA	474
UC Davis	USA	453
UC Berkeley	USA	428
U Washington Se.	USA	408
ETH Zurich	SWITZERLAND	407
Cornell U	USA	403
U Wisconsin-Madd.	USA	380
U Queensland	AUSTRALIA	360
U Oxford	UK	357
U British Columbia	CANADA	351
Stanford U	USA	347
U Florida	USA	333
Ghent U	BELGIUM	323
U Minnesota - TC	USA	303
Zhejiang U	CHINA	301

Tsinghua U high cite papers 2006-09 to 2013-16

mc = mathematics and computing, pse = physical sciences and engineering

	2006-09	2007-10	2008-11	2009-12	2010-13	2011-14	2012-15	2013-16
Top 10% maths/comput	164	173	185	195	245	307	382	432
Top 10% ps/engineering	594	636	689	737	850	975	1097	1269
Total 10% all STEM	758	809	874	932	1095	1282	1479	1701
Top 1% maths/comput	8	12	11	15	23	27	41	42
Top 1% ps/engineering	52	60	73	81	86	98	102	117
Total 1% all STEM	60	72	84	96	109	115	143	159
World position 10% mc	10th	8th	5th	5th	1st	1st	1st	1st
World position 10% pse	8th	8th	7th	6th	5th	3rd	3rd	1st
Position top 10% STEM	**8th**							**1st**
World position 1% mc	66th	38th	40th	23rd	8th	5th	1st	1st
World position 1% pse	21st	18th	12th	8th	8th	6th	7th	5th
Position top 1% STEM	**24th**							**5th**

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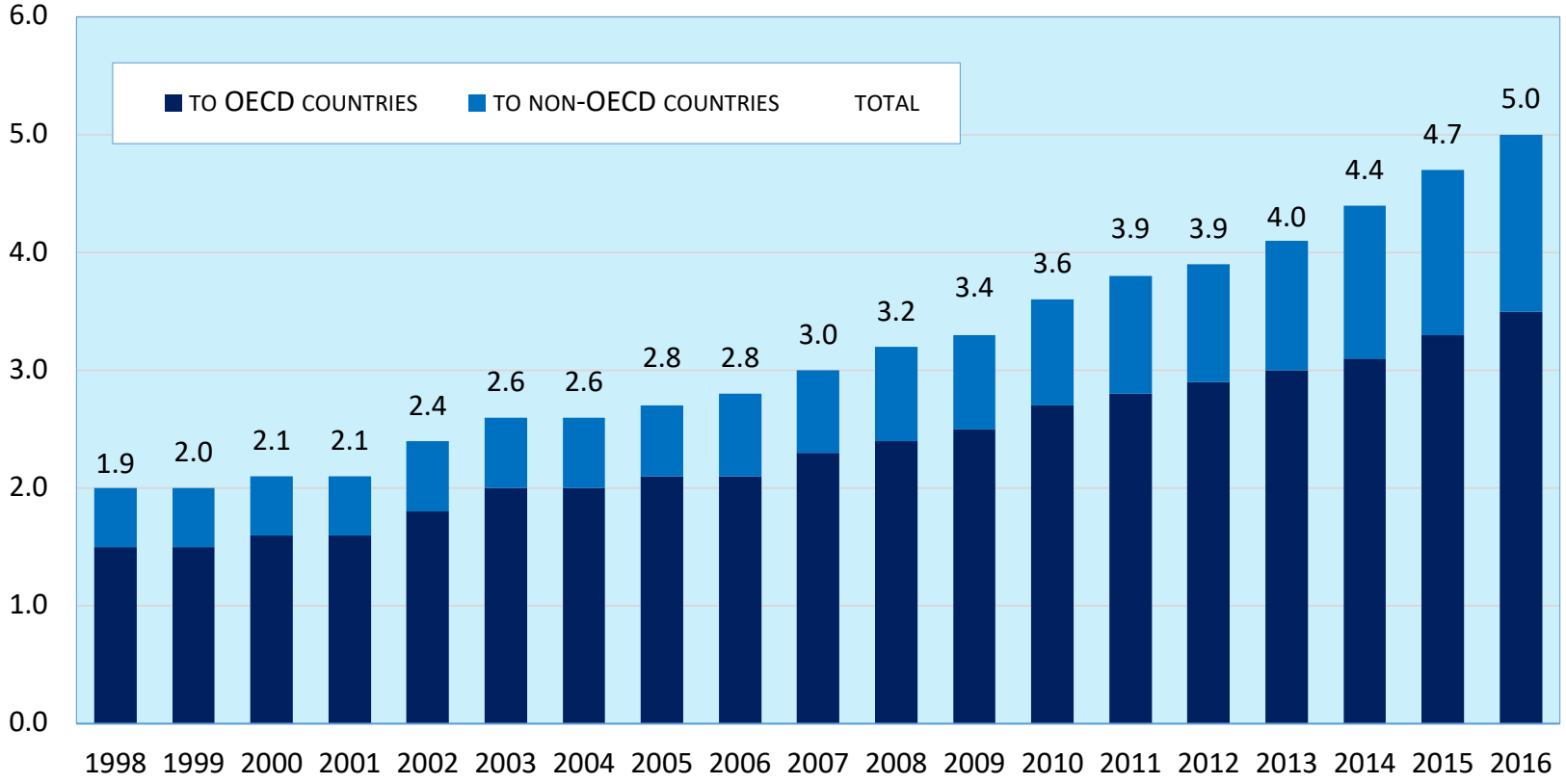
- Continuing growth of international student mobility

International or foreign student enrolment in tertiary education, 1998-2016 (millions)

OECD data 2018



Internationally mobile/ foreign[*] doctoral students as % of all doctoral students, 2015

Numbers in brackets = number of top 500 universities, ARWU 2018

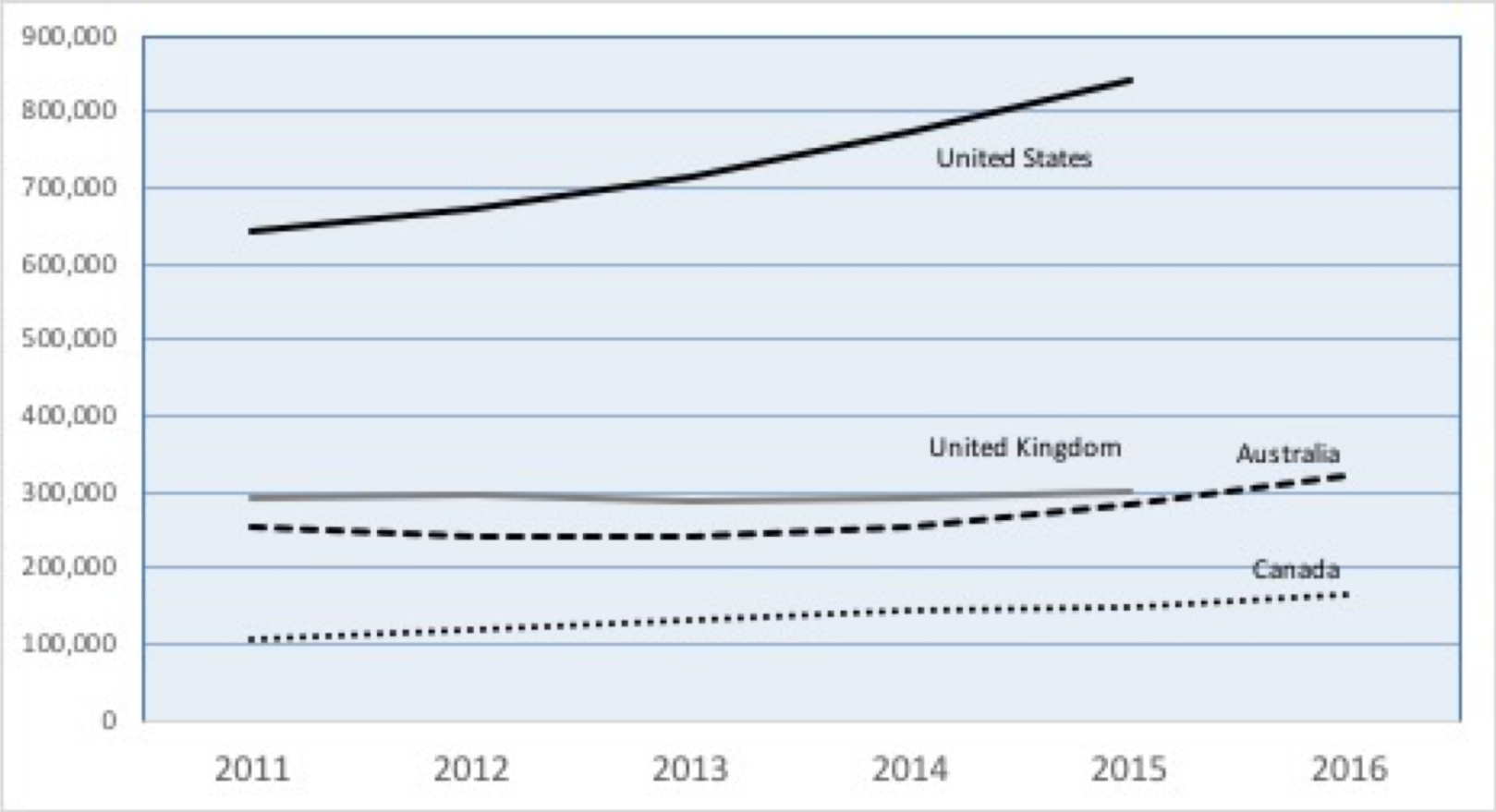
Luxembourg (0)	87.0%
Switzerland (8)	54.3%
New Zealand (4)	46.2%
UK (39)	42.9%
Belgium (7)	42.3%
France (19)	40.1%
USA (139)	37.8%
Netherlands (11)	36.2%
Sweden (11)	34.0%
Australia (23)	33.8%
Denmark (5)	32.1%
Iceland (0)	31.6%

Austria (6)	27.0%
OECD average	**25.7%**
Ireland (4)	25.4%
Canada (18)	24.4%
Brazil* (6)	22.4%
Portugal (4)	21.2%
Norway (3)	20.5%
Finland (4)	19.9%
Japan (16)	18.2%
Czech Rep.* (1)	14.8%
Estonia (1)	10.7%
Germany (36)	9.1%

Slovak Rep.* (0)	9.1%
Latvia (0)	8.8%
South Korea* (10)	8.7%
Slovenia (1)	8.5%
Chile (2)	8.4%
Hungary (0)	7.2%
Turkey* (1)	6.5%
Israel* (6)	5.5%
Russian Fed.* (4)	4.5%
Mexico (1)	2.6%
Poland (2)	1.9%

International students entering large English-speaking countries from outside Europe

Incoming international students USA, UK, Australia, Canada: 2011-2016
UNESCO data



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