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Equal but different: Implications of the rise of China in universities and science

(OR, what happens when Pax Americana gets down and dirty with Tianxia)

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Globalisation is uneven by sector

Tendencies to global integration: reversing in the economy since 2008 but still increasing in higher education and science

sector	One global system	Multi-lateral system	Cross border flows	Notes
Trade	NO	YES*	YES	There are growing barriers to open trade
Finance	NO	YES	YES	Reversal of earlier growth of financial flows
Communications	YES*	YES	YES	Emerging national blockages, technology cold war
Governance	NO	YES**	NO	No momentum to global integration, growing tensions
Science	YES	YES	YES	Global cooperation and still increasing
Higher education	NO	YES**	YES	Extensive cross-border engagements and effects

* with exceptions, nations that operate outside the common framework

** weak except in Europe and to a more limited extent, ASEAN

This is changing everything



The great freeze

(Washington Post illustration; AP: iStock)

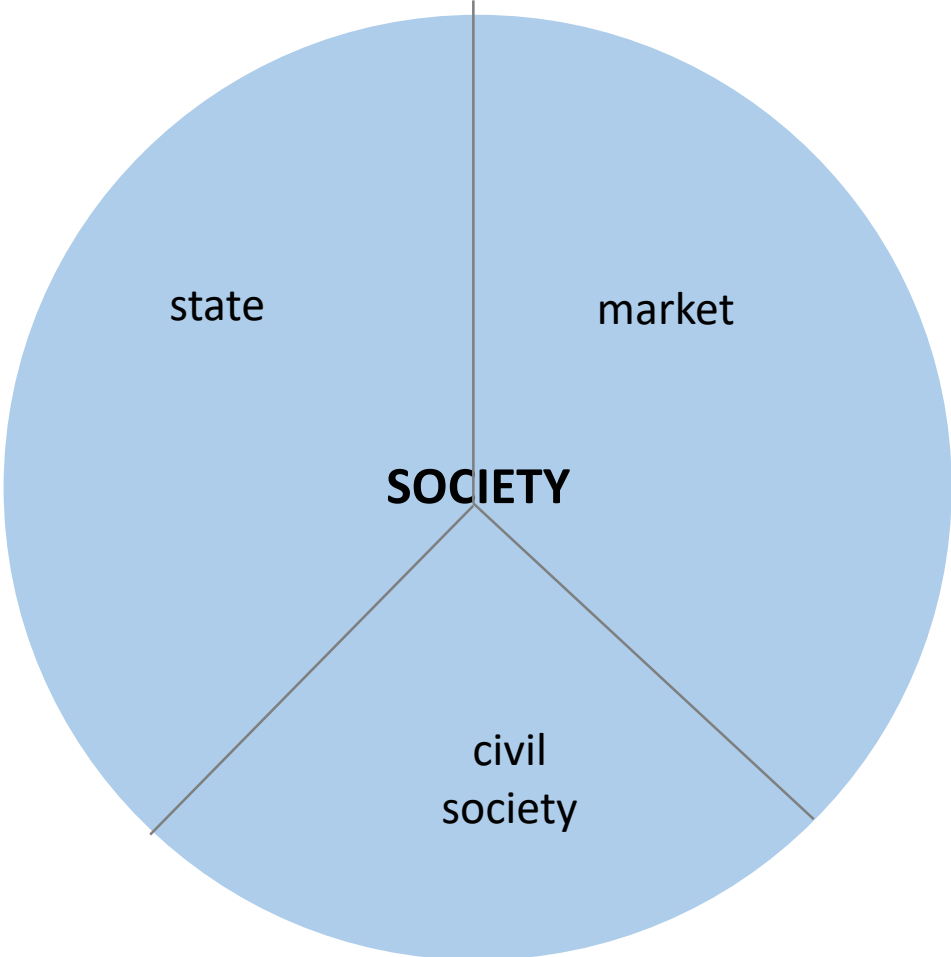
Western political imaginary 1



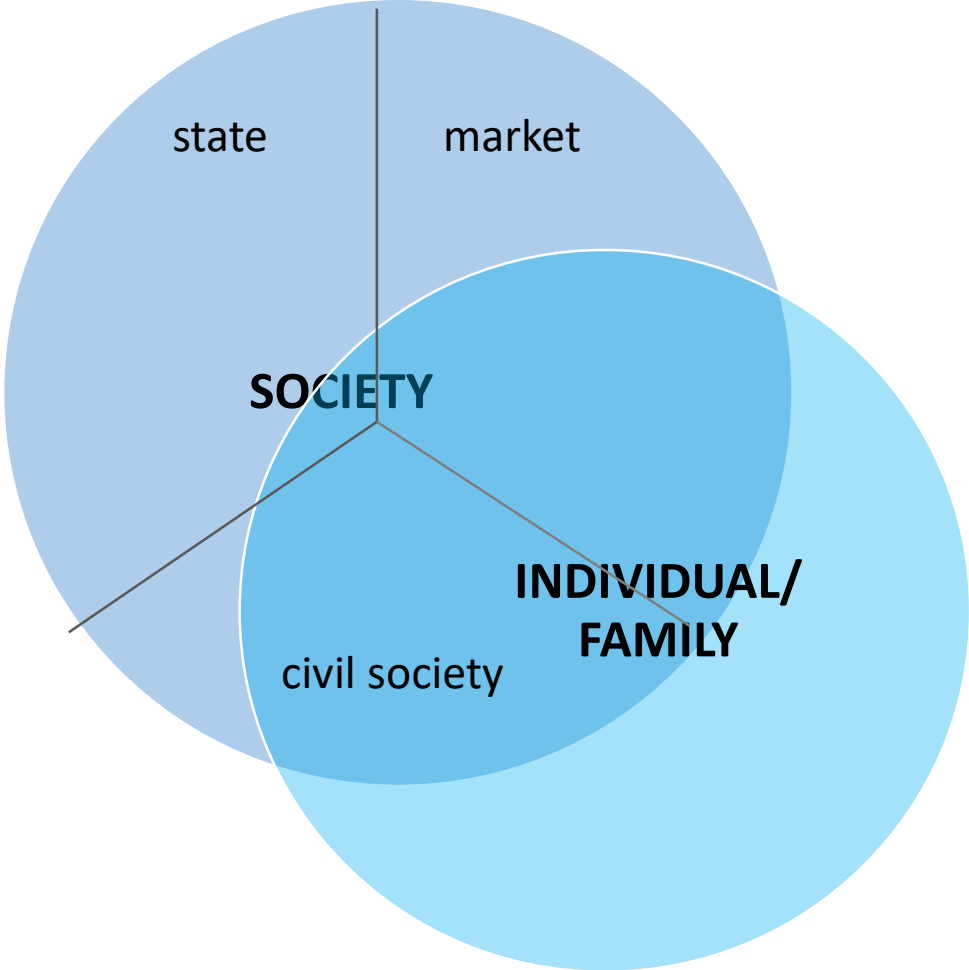
SOCIETY

**INDIVIDUAL/
FAMILY**

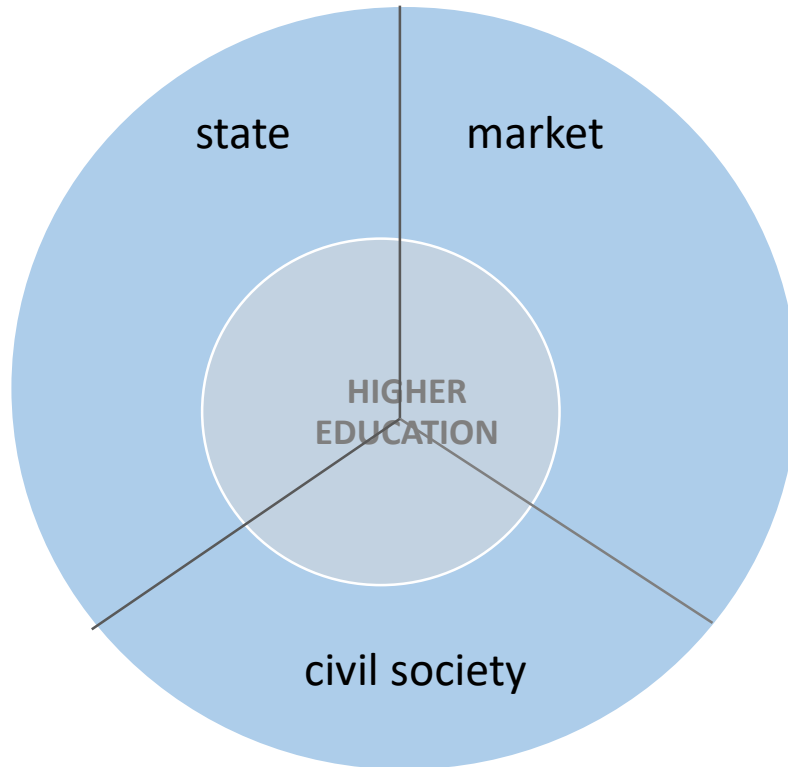
Western political imaginary 2



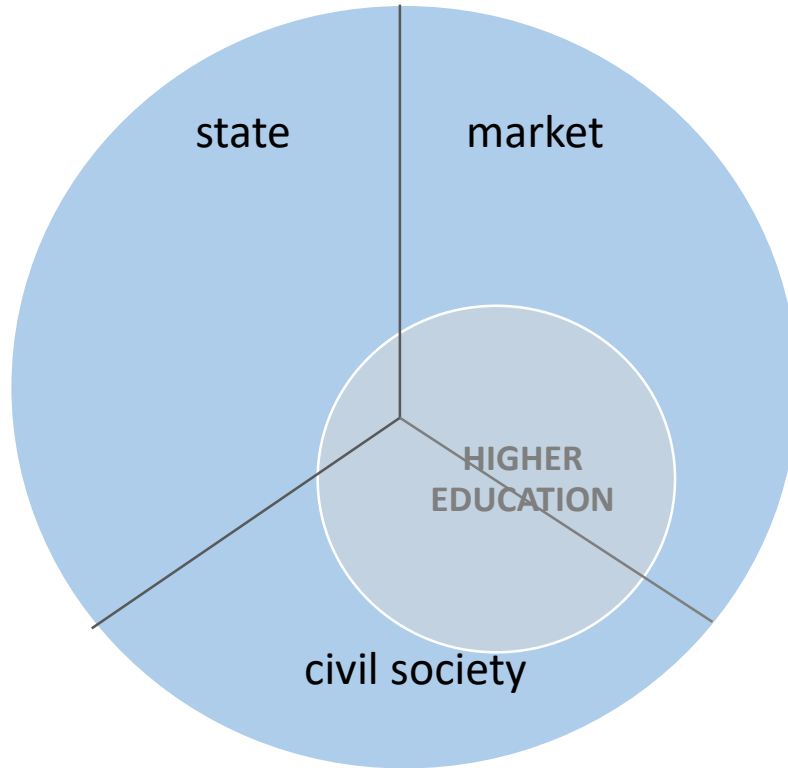
Western political imaginary 3



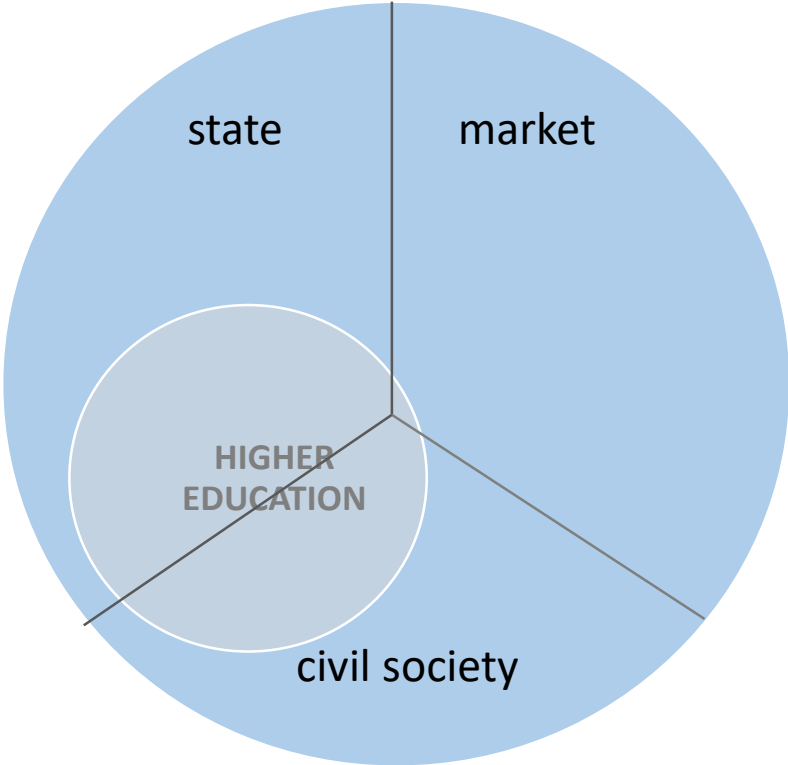
Western political imaginary with higher education added



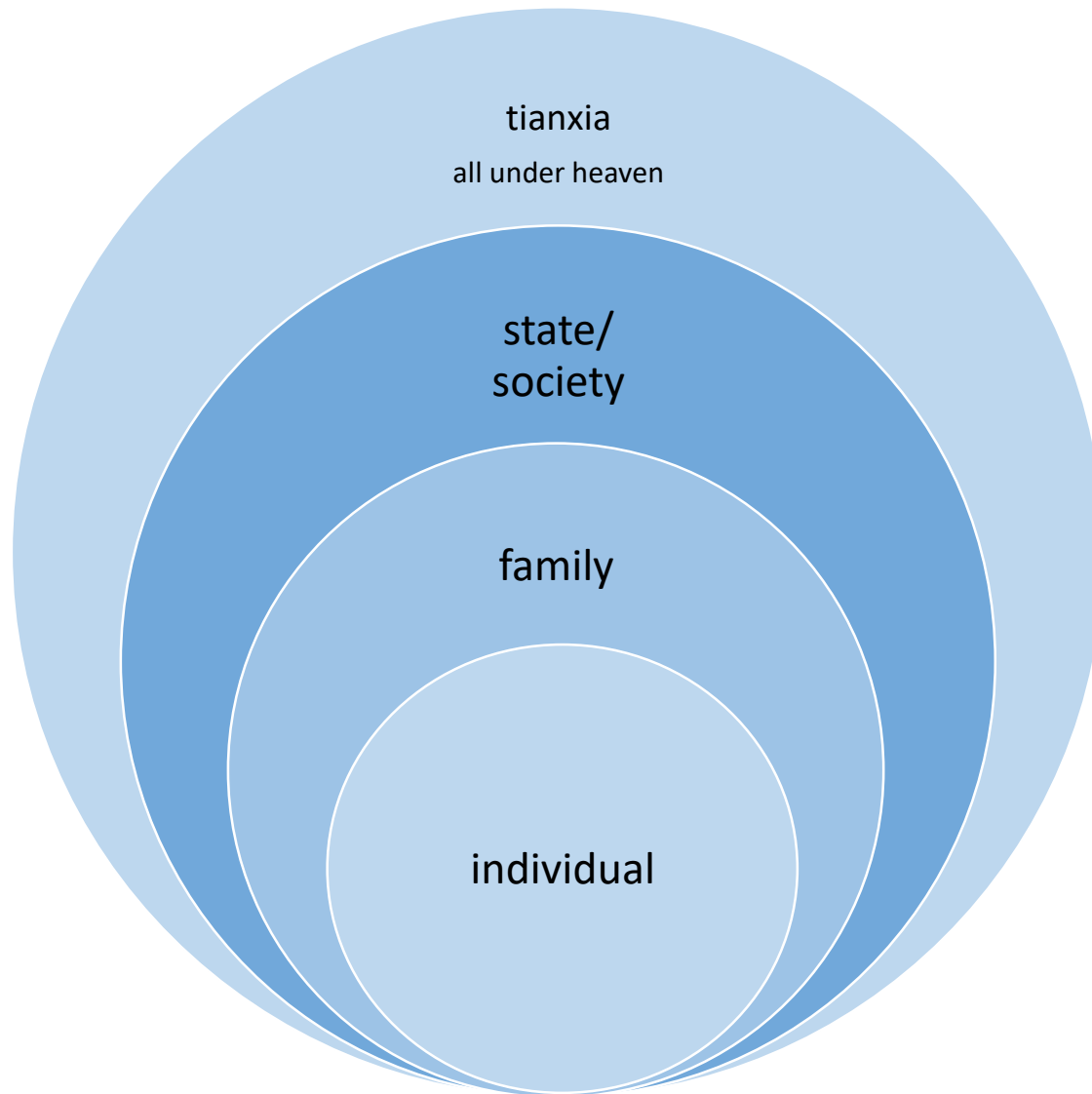
Western political imaginary (USA version) with higher education added



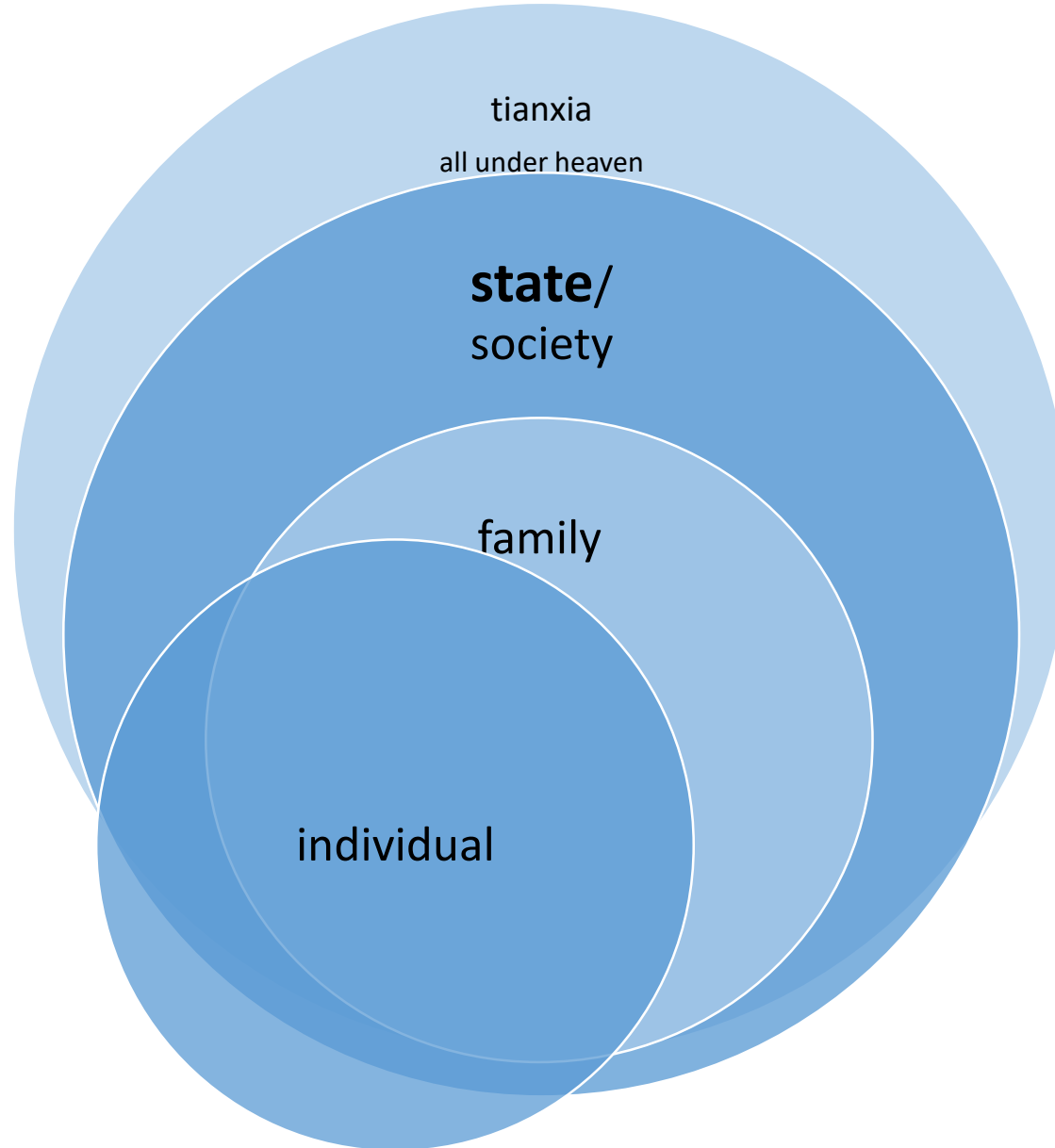
Western political imaginary (Nordic) with higher education added



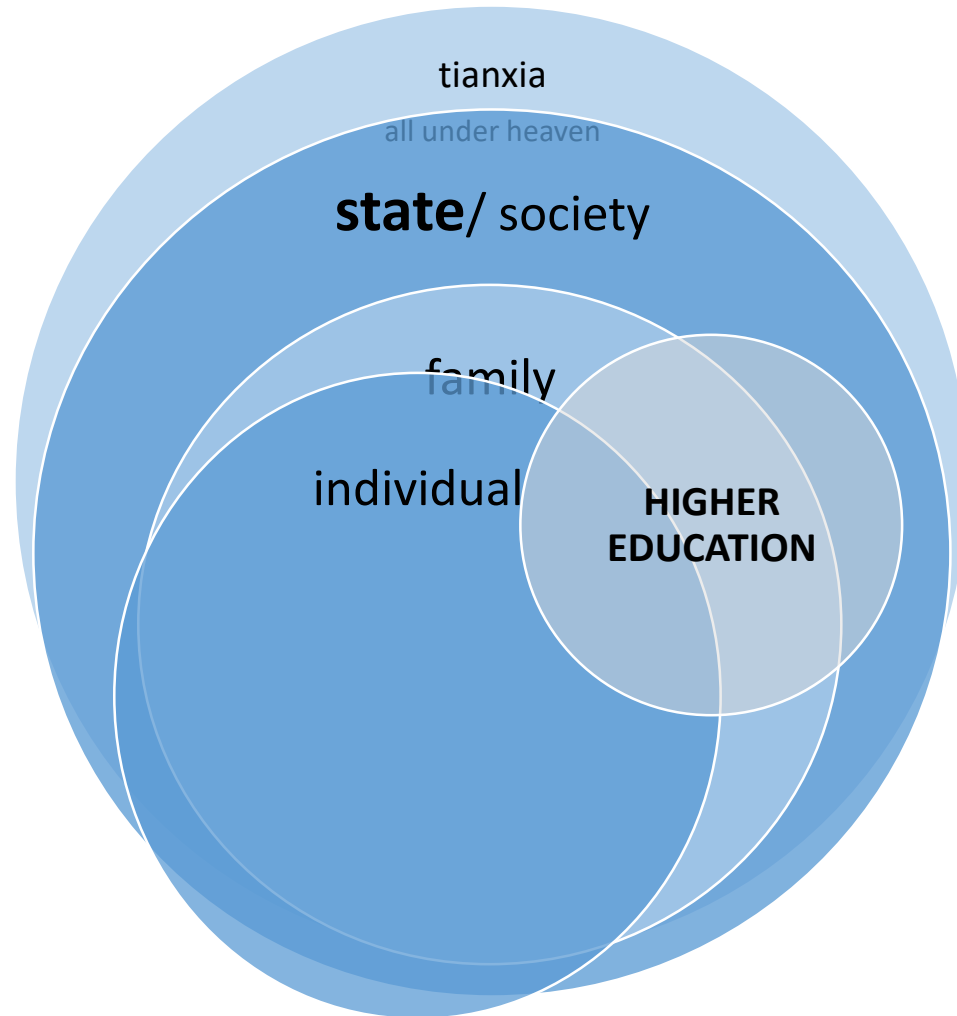
Confucian political imaginary



Post-Confucian political imaginary



Post-Confucian political imaginary with higher education



Basis of opening up after 1978

- Deng Xiaoping “considered science to be the most crucial of the four modernizations, the one that would drive the other three (industry, agriculture and national defense).” (Vogel, 2011, p. 197)
- Depoliticisation: “Deng said that science had no class character; it could be used by all classes and all countries despite their different political and economic systems” (Vogel, 2011, p. 201). It was enough that scientists were loyal to country and party (p. 202)
- Catch up was essential but China needed original and basic science: Deng saw internationalisation not as a source of borrowed science but a guide to building China’s own capacity

Vogel, E. (2011). *Deng Xiaoping and the transformation of China*.
Cambridge, MA: Belknap Press



Regulated autonomy, hyper performance

- Deng's managed devolution in science, using the dual leadership system, enabled the party-state to combine regulated academic freedom and open global connections with top-down policy control - paralleling governance in the new economic zones
- The party-state secured a remarkable capacity for growing universities and science: Investment tailored to performance targets; outcome focused control (New Public Management + state Leninism); neoliberal competition; structured incentives
- Thoroughgoing international engagement enabled China to rapidly increase its science capacity in tandem with the expansion of global research after 1990
- The model delivered much better outcomes in applied science and engineering than in social sciences and humanities

Internationally co-authored papers 2016

Cases of more than 6000 jointly-authored papers

Country pair	Joint papers	Country pair	Joint papers	Country pair	Joint papers
China-USA	43,968	France-UK	10,079	Netherlands-UK	8039
UK-USA	25,858	Italy-UK	10,023	Germany-Netherlds	7746
Germany-USA	21,584	South Korea-USA	9553	Brazil-USA	7606
Canada-USA	19,704	Spain-USA	9530	Canada-China	7245
France-USA	14,440	Australia-China	9246	Germany-Spain	6871
Germany-UK	14,200	Netherlands-USA	9078	India-USA	6759
Italy-USA	12,784	Australia-UK	8838	China-Japan	6706
Australia-USA	12,127	Germany-Italy	8821	Canada-UK	6685
Japan-USA	10,484	Switzerland-USA	8455	China-Germany	6419
China-UK	10,472	Germany-Switzerland	8310	Sweden-USA	6383
France-Germany	10,084	France-Italy	8182	France-Spain	6305

Data: US National Science Board

Total science papers 2014-17: Leiden ranking

university	country	Total papers	% papers in top 5%
Harvard U	USA	33,188	12.8
Shanghai Jiao Tong U	CHINA	22,367	4.2
U Toronto	CANADA	22,149	7.5
Zhejiang U	CHINA	22,100	4.9
Tsinghua U	CHINA	18,404	6.9
U Michigan	USA	18,203	8.1
Johns Hopkins U	USA	16,902	8.4
U Sao Paulo	BRAZIL	16,846	2.8
Peking U	CHINA	16,171	5.1
Seoul National U	KOREA	15,969	3.5
Stanford U	USA	15,543	13.1
Sichuan U	CHINA	14,792	3.7
Huazhong UST	CHINA	14,745	4.7
U Oxford	UK	14,698	10.2

Papers in top 5% by cites 2014-17: Leiden

university	country	Top 5% papers	Top 1% papers	% of all papers in top 5%
Harvard U	USA	4242	1076	12.8
Stanford U	USA	2044	563	13.1
U Toronto	CANADA	1653	329	7.5
U Oxford	UK	1571	355	10.7
MIT	USA	1549	436	15.0
U Michigan	USA	1469	298	8.1
Johns Hopkins U	USA	1424	314	8.4
U College London	UK	1382	318	9.7
U Washington Seattle	USA	1364	297	9.5
U California - Berkeley	USA	1355	328	12.1
U Cambridge	UK	1324	312	10.1
Tsinghua U	CHINA	1270	255	6.9
U Columbia	USA	1232	274	10.1
U California – Los Angeles	USA	1230	278	9.1

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: 2014-2017

University	System	Physical sciences & engineering
Tsinghua U	CHINA	776
MIT	USA	691
Stanford U	USA	598
UC, Berkeley	USA	580
Harvard U	USA	552
Zhejiang U	CHINA	509
Nanyang TU	SINGAPORE	503
U Science & T.	CHINA	452
U Cambridge	UK	449
Shanghai J TU	CHINA	398
ETH Zurich	SWITZERLAND	394
Peking U	CHINA	389
Imperial CL	UK	388
NU Singapore	SINGAPORE	384

University	System	Maths & computing
Tsinghua U	CHINA	236
Harbin IT	CHINA	182
Zhejiang U	CHINA	155
Huazhong U S&T	CHINA	153
U Electronic S&T	CHINA	143
Xidian U	CHINA	142
Beihang U	CHINA	141
MIT	USA	138
Nanyang TU	SINGAPORE	137
NU Singapore	SINGAPORE	137
Shanghai J TU	CHINA	130
City U HK	HK SAR	124
South East U	CHINA	123
Stanford U	USA	119

But three decades of US/China cooperation were based on different assumptions



Deng Xiaoping in Texas, February 1979

CHINA

1. They have superior technology and economy
2. We have to open up in order to catch up

UNITED STATES

1. We are superior and must win in open competition
2. If they open up to us they will become more like us

No prizes for guessing who was right and who was wrong

CHINA

1. They have superior technology and economy
2. We have to open up in order to catch up

ASSUMPTIONS RIGHT

Outcome: Rapid national advance. Successful global integration

UNITED STATES

1. We are superior and must win in open competition
2. If they open up to us they will become more like us

ASSUMPTIONS WRONG

Outcome: Disillusionment. Shift to global confrontation and closure

From global cooperation to New Cold War

A more combative United States, a more assertive China



The United States wants to 'contain China'

which must affect universities and research (the question is how much?)

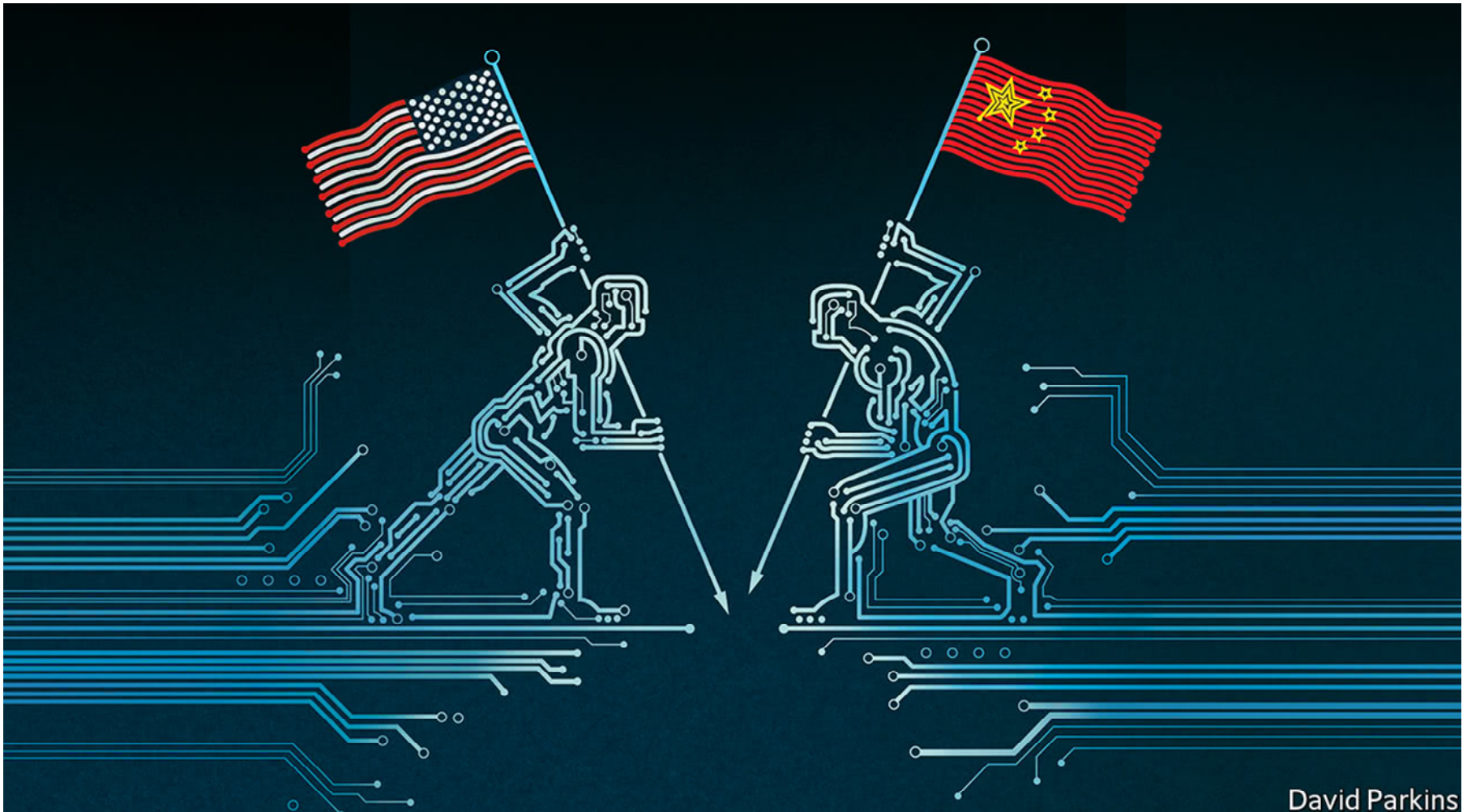
AMERICAN MILITARY BASES AND FACILITIES NEAR CHINA



Trade Cold War, Technology Cold War

A Science Cold War to come? In US some argue that China benefits more from science cooperation than does US. However, more collaborative high citation papers are first authored by Chinese authors than by American authors (Lee, 2019)

Graphic: *The Economist* magazine



Growing barriers to cooperation

- *Racial and national profiling in United States:* Hostile investigations of Chinese nationals with US NIH research grants, claiming breach of grant conditions. Growing American claims of 'spying' by Chinese researchers and students
- *Slowing of mobility:* Visa refusals for Chinese researchers and students entering US, even in fields such as education. Fall in numbers of Chinese students entering USA and Australia
- *Retaliation:* Visa difficulties for some US nationals entering China. Pressure on foreign academic activities inside China. Stepped up party-state interventions in countries outside China
- *Global polarisation:* US pressure on US allies such as Australia, Canada and in Europe to adopt a more hostile policy on Huawei and in relation to research collaboration with China

What we can do

1. Separate questions of university autonomy and academic freedom from general political and civil freedoms
2. Strongly assert a common position on academic freedom of thought, speech, teaching, learning, writing, research and communication
3. Advance the value of plurality of thought and method, between disciplines and within disciplines
4. Quarantine off from this regime of freedom the small portion of research where national security is primary
5. Strongly assert the partial autonomy of universities and their obligation to shape teaching and research agendas
6. Defend and advance cross-border academic mobility