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National-global synergy in the development of higher education and science in China since 1978

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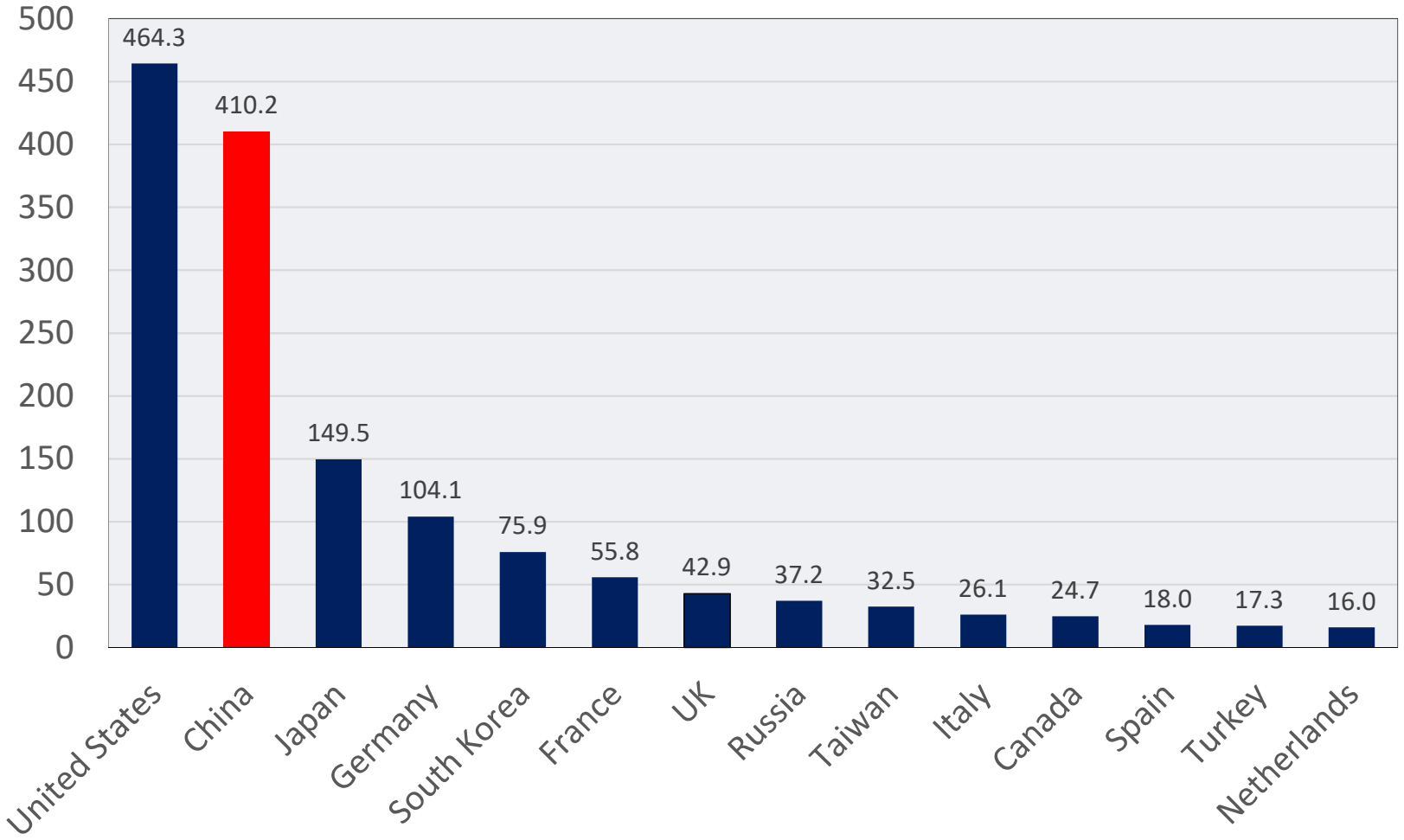
National-global synergy in the development of higher education and science in China since 1978

- Achievements
- The foundations
- Global factors
- National factors
- Tensions and limits

ACHIEVEMENTS

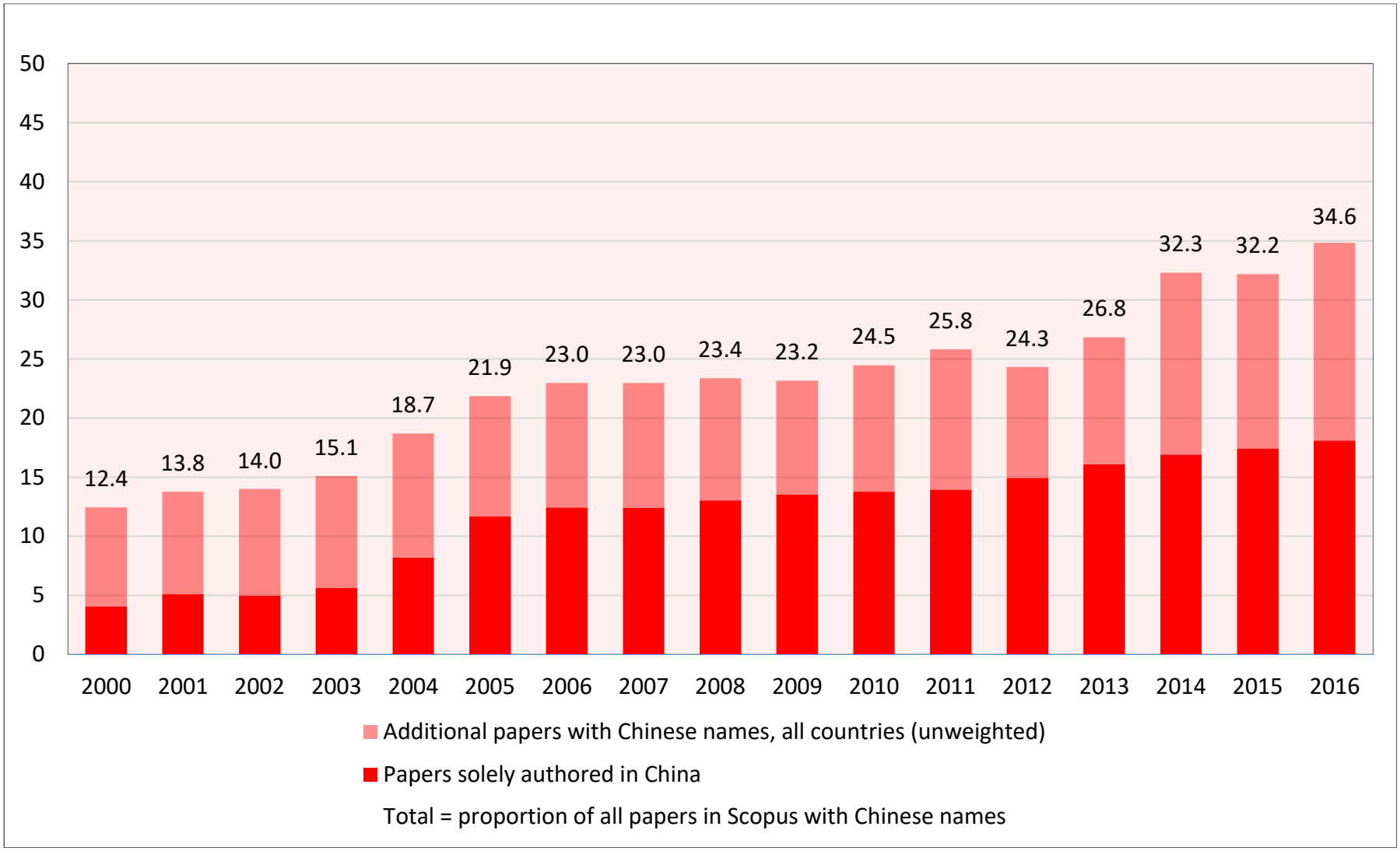
National investment in R&D, 2016

OECD data, $s billion, constant 2010 USD PPP



Growth of China-associated science papers

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



World's leading universities in Physical Sciences STEM disciplines

high citation papers (top 5% in the field) in 2013-16

University	System	Top 5% papers in Mathematics & Computing
Tsinghua U	CHINA	230
Harbin IT	CHINA	165
MIT	USA	155
Zhejiang U	CHINA	153
Nanyang TU	SINGAPORE	147
Huazhong U S&T	CHINA	142
Xidian U	CHINA	140
NU Singapore	SINGAPORE	134
Stanford U	USA	131
South East U	CHINA	121
U Electronic S&T	CHINA	121
City U Hong Kong	HK SAR	112

University	System	Top 5% papers in Physical Sciences & Engineering
Massachusetts IT	USA	705
Tsinghua U	CHINA	645
UC Berkeley	USA	625
Stanford U	USA	559
Harvard U	USA	538
Nanyang TU	SINGAPORE	528
Zhejiang U	CHINA	460
U Cambridge	UK	451
U Science & Tech	CHINA	444
NU Singapore	SINGAPORE	384
ETH Zurich	SWITZERLAND	366
Caltech	USA	364

THE FOUNDATIONS

Strategic assumptions in 1978

- Why: Deng “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)
- China needed original and basic science: Deng saw internationalization not as a source of borrowed science but a guide to building China’s own capacity.

A centrally controlled depoliticisation

and installation of the dual authority system in science

- “Deng also responded to the continuing complaints of scientists that their professional work should be directed by someone familiar with the content. He directed that scientific institutes be reorganized with three top leaders at each institute. The party leader would manage overall policy, but the basic work of the institute would be under the direction of a leader trained in science. A third leader would be in charge of ‘rear services’, with responsibility for improving the living conditions and for ensuring that the scientists had adequate supplies to carry on their work. Aware that intellectuals were upset that they had to spend so much time engaged in physical labor and political education, Deng established a new rule that at least five-sixths of the scientists’ work week was to be spent on basic research.”

  - Vogel, E. (2011). *Deng Xiaoping and the transformation of China*. Cambridge, MA: Belknap Press (p. 208).

National-global synergy

- In the rise of science and higher education in China both national and global factors have been continually in play
- Nations and WCUs exist in the global context and routinely interact with it.
- What has been especially important in China has been the engineered *connection* between national and global activity,

GLOBAL FACTORS

The growth of global science

- The advent of the Internet in the early 1990s saw the rapid growth of global science as a networked system, and its rise to dominance in relation to most national science systems
- The global science network is an open system primarily driven by bottom-up disciplinary conversations not nations. Leading countries and universities do not monopolise activity. They nurture emerging players. This was the dynamic to which China became joined in synergistic fashion
- Policy drove international benchmarking and mobility, so that expanding global science carried China along with it

Other global conditions helped

- Timing : Post-1990 was an especially favourable time to plug into globalisation (i.e. global integration and convergence). In the expanding open global space, at first there were relatively few national interest barriers in place
- Positive sum dynamic: China's rise in the economy, science and higher education did not directly impair the United States. China achieved number two power status before the pushback began
- In science and higher education the pushback came even later

NATIONAL FACTORS

Regulated devolution

- In the distinctive Chinese civilizational (Post-Confucian) state, politics is in command, and the state has a comprehensive role
- Within this tradition the Leninist party-state has achieved an unprecedented capacity for developing universities and science. Investment tailored to performance targets. Control systems (New Public Management + state Leninism) secure the targets
- Deng's managed devolution in science, using the dual leadership system, enabled the state to combine regulated academic freedom and open global connections with top-down control. This paralleled the approach in the new economic zones

Nationally controlled global linkages

- Compartmentalisation: China under Deng and after exhibited a distinctive capacity to separate international and domestic relationships. Deng opened economy and universities to foreign science and people mobility without losing party-state control. Even during Tiananmen in 1989 he urged that China stay open
- Strong national identity *and* effective engagement: China in general and in higher education has been able to create a separate power by operating partly outside world systems, but it has also linked to those systems to maximum effect. Globalisation managed on China's terms

TENSIONS AND LIMITS

Unique governance

- Arguably, the Chinese university is still pursuing its foundational project of the late Imperial and early Republican periods, that of a force for modernisation that is largely external to China
- The orthodox Western disciplines frame university knowledge, synergies with Chinese tradition are under-developed
- Where China has developed a unique approach is in the *governance* of higher education—where a focused state is combined with autonomous disciplinary science engaged in global networks, and regulated by dual university/state authority. This approach has proven to be highly functional

Limits

- Universities in China have combined three elements: the political system (the Leninist state), the corporate university, and academic norms of open science and decision-making on the basis of disciplinary judgment. Leninism in China is more flexible and performance focused than in Soviet Russia but prone to risk aversion. The balance could shift in favor of the first element, so the party-state overwhelms autonomous disciplinary cultures
- Corporate university managers also threaten disciplinary cultures
- It is especially difficult to achieve a free wheeling social science (which may not endorse the party-state's concept of the social), and independent Chinese characteristics in the humanities