

Research in China

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The rise of China as a scientific power has been rapid, with its publication output heavily focused in the physical sciences. This growth has brought with it changes in attitudes towards scholarly communication and open research, and practices of Chinese early career researchers.

The Rise of China

The US remains the no.1 content output country but is increasingly being challenged by China. Among the 5 countries that produced most content (2014–2018), only China has seen a growth rate (proxy Compound Annual Growth Rate – CAGR) above the worldwide average (Figure 1). China is also seeing steadily improving research quality (proxy Field Weight Citation Impact – FWCI) (Figure 2).

Figure 1. Top 5 Countries¹ Comparison: CAGR, Average IWC & Article % (2014–2018)

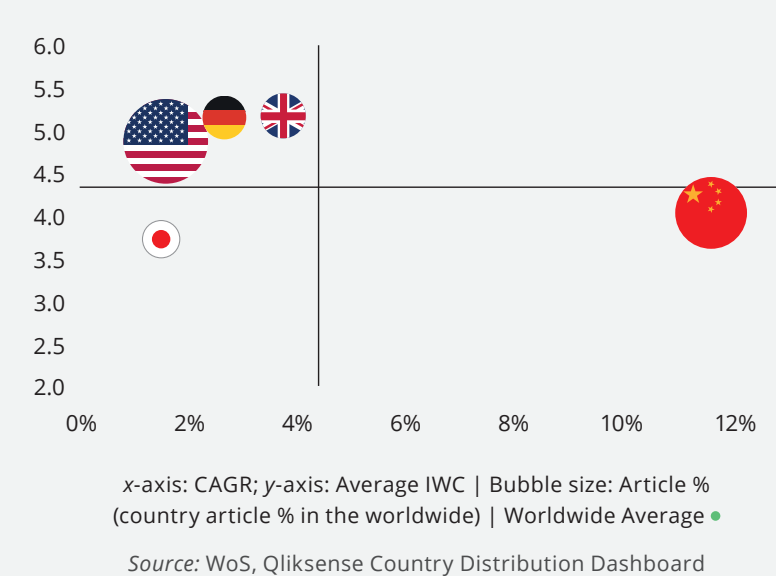


Figure 2. US & China Comparison: FWCI (2014–2018)

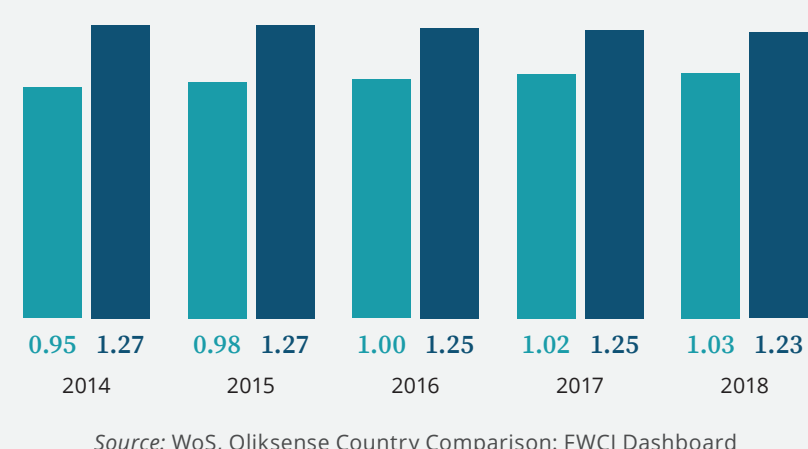
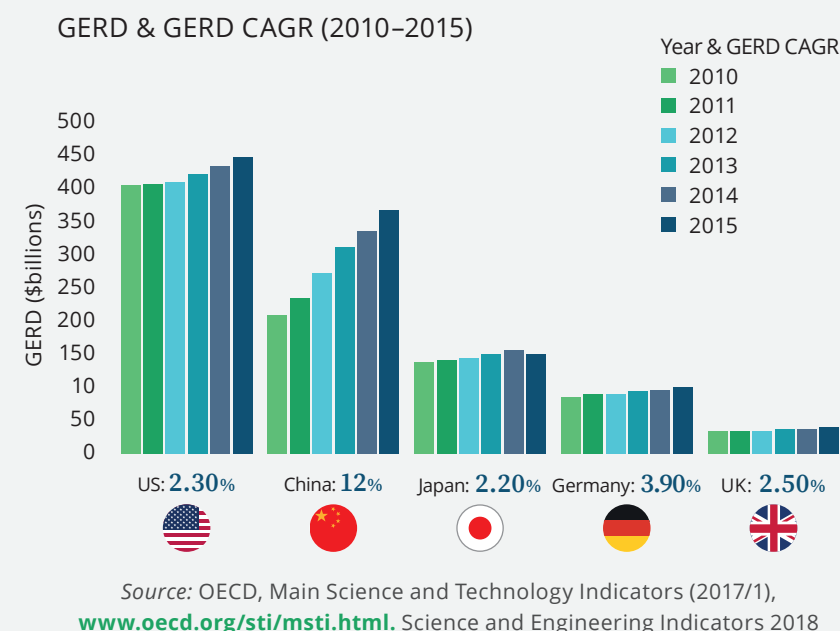


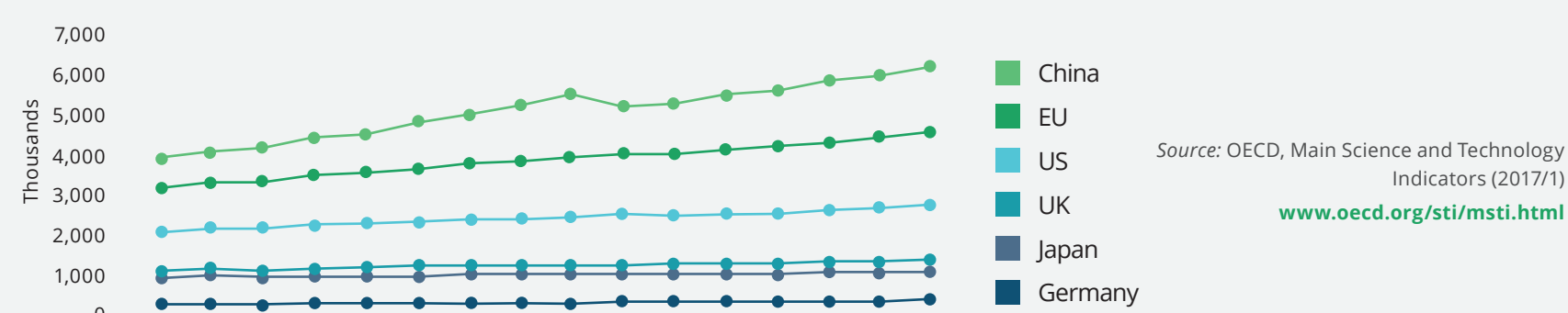
Figure 3. Top 5 Countries¹ Comparison: GERD & GERD CAGR (2010–2015)



The fast-growing research output and steadily improving research quality of China has a close relationship with its continually rising heavy Gross Expenditure on Research & Development (GERD) (Figure 3). It is forecast² that China will exceed the US in 2018 in GERD, although the US is by far (2010–2015) the largest GERD performer.

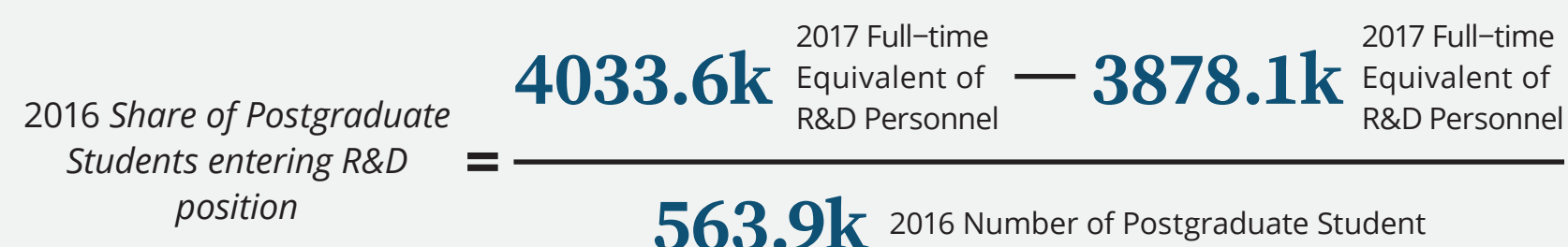
That aside, following the European Union, China has the highest number of researchers (Figure 4). It has also seen a jump of 40% in the number of highly cited researchers from 2017 to 2018.³

Figure 4. Selected Countries/Regions Comparison: # of Researchers (2000–2015)



Early Career Researchers in China

The 2016 share of Postgraduate Students entering R&D positions is roughly 27.6%, with 21.6% in 2015 and 9.0% in 2014.



CIBER5 extensively studied the change of scholarly communication attitudes and practices of Early Career Researchers (ECR) in more than 20 aspects between 2016 and 2018. Some results are given below.

Things That Did Not Change Much

- Metrics:** Traditional citation measurements such as the Journal Impact Factor still reigns supreme although interest in alternative metrics continues to grow.
- Evaluation System:** The academic research system and evaluation policy is largely unchanged although national policy has been issued to break the obsessions about academic articles, professional titles, academic degrees and prizes in talent and research evaluation.
- Authorship:** The corresponding author is still important in job promotion and assessment, and brings reputational (and sometimes) financial rewards. Journals allowing more than one corresponding author is of interest.

Things That Changed

- Collaboration.** Compared with 2016, Chinese ECRs are far more positive towards collaborating and sharing information with colleagues and peers.
- Social media.** ECRs spend more time on social media platforms than they did three years ago. Social media platforms, such as WeChat, a Chinese multi-purpose messaging, social media and mobile payment app, now dominate ECRs daily communications, in both the scholarly and social environment. ResearchGate is popular as a source of scholarly readings.
- Open access (OA) publishing.** More ECRs have experience publishing papers in OA journals or have deposited their publications in institutional repositories. In general, the data show a community split over OA and its benefits.

¹ Early Career Researchers: the harbingers of Change? Year Three: Final Report, CIBER5, ciber-research.eu/download/20181218-Harbingers3_Final_Report-Nov2018.pdf

Open Research in China

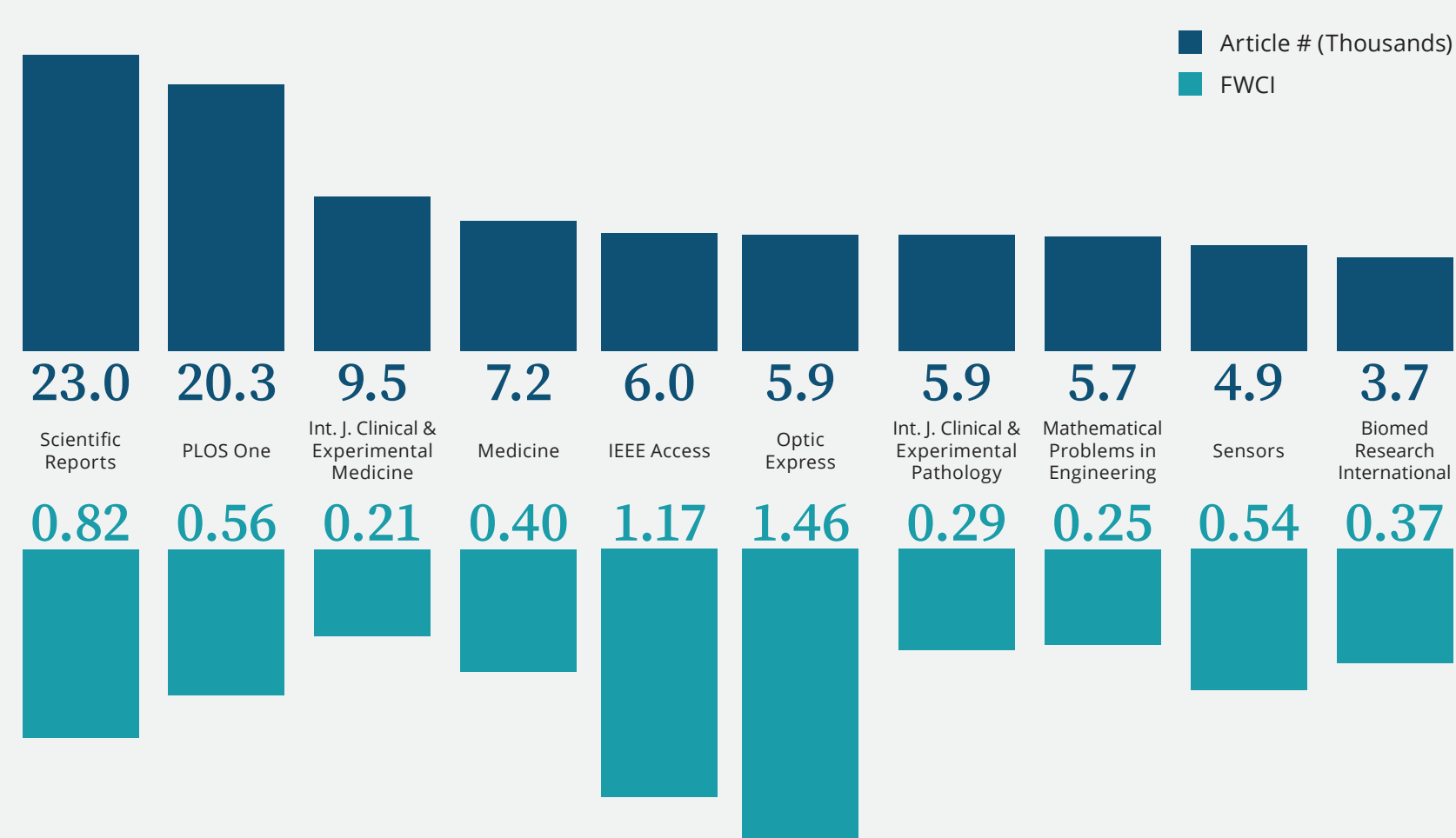
Open Access

- There is notable growth of Open Access (OA) in China.
- OA has grown more quickly than the China average (2013–2017 CAGR: OA 20.2% vs China average 12.9%).
- Major funders in China (CAS, MOST and NSFC) have established policies for green OA.

Open Data

- Open Data has received a lot of attention in China recently.
- In March 2018, the General Office of the State Council issued the notice "Measures for Managing the Printing and Distributing of Scientific Data", with the aim to further strengthen and standardize the management of scientific data and improve the level of open sharing.

Figure 9. Top 10 Most-published OA Journals in China: # of Articles (bars) & FWCI (diamonds) (2014–2018)



Open Publishing Practices

- Transparent Peer Review:** According to CIBER5, in China, there are still significant reservations around open peer review, which ECRs think does not work because only anonymity can guarantee fairness.
- ChinaXiv:** ChinaXiv is the no.1 preprint platform in China and follows the international standard operation regulation. It has several sub-domains including PsyChinaXiv Preprints, ChinaXiv Biology Preprint Platform, Rock Mechanics and Engineering Preprint Platform, and China Music Law Preprint Platform (test).

Subject Area Spotlight

There is obvious difference among subjects and the boarder disciplines they are in. The top 10 subjects where China has a heavy share in the worldwide article output fall within the Physical Sciences (PS). Chemistry, Multidisciplinary has grown the most quickly, while Nanoscience & Nanotechnology has the highest FWCI (Figure 5).

Articles in the top 10 subjects consist of more than one third of the total China content. Among these 10 subjects, 7 fall in PS and 2 in Health and Medical Science (HMS) (Figure 6). Nanoscience & Nanotechnology has the highest FWCI, whereas Oncology has grown fastest. Subjects in the HMS fields grow more quickly (proxy CAGR), compared with subjects in PS. All top-ten subjects by quality (proxy FWCI) are in PS (Figures 7 and 8).

Figure 5. Top 10 Subjects⁴ Comparison: CAGR, FWCI & China % (2013–2017)

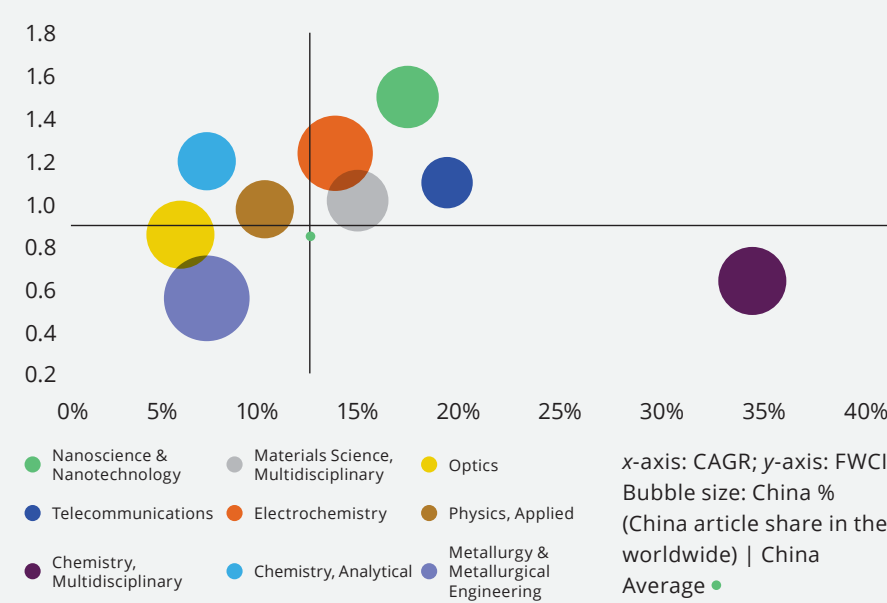


Figure 6. Top 10 Subjects Comparison: CAGR, FWCI & Article % (2013–2017)

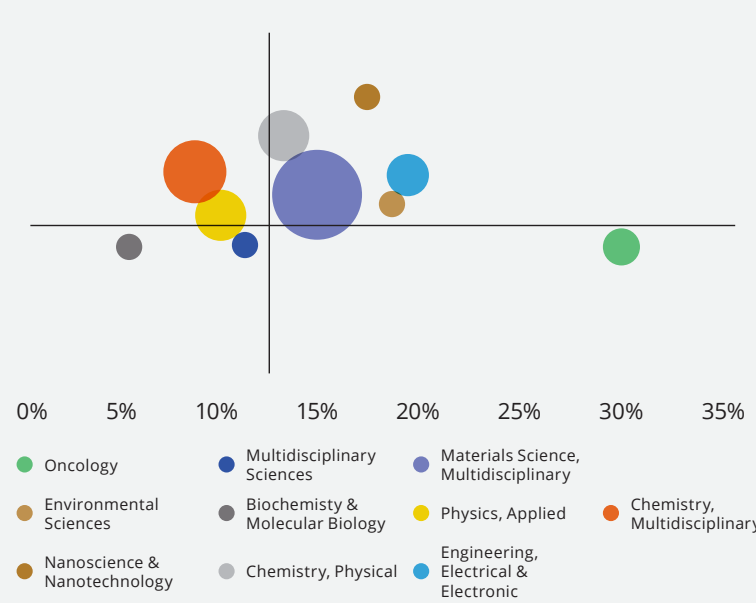


Figure 7. Top 10 fast-growing Subjects⁴ Comparison: CAGR & Article % (2013–2017)

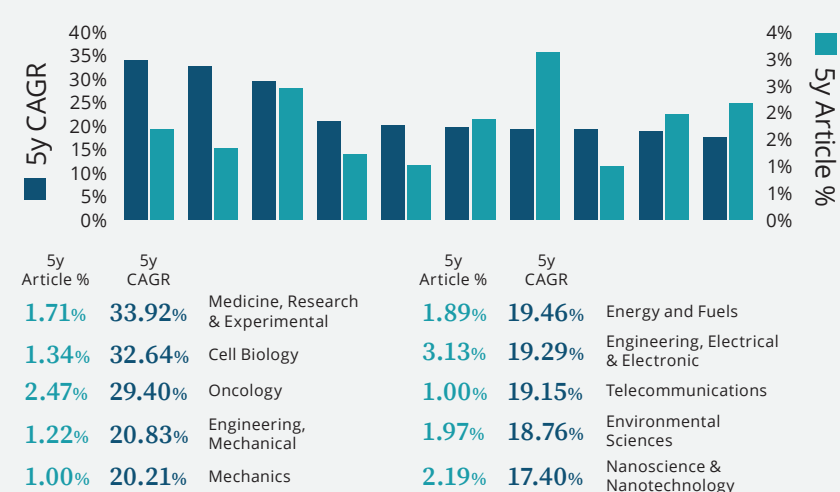
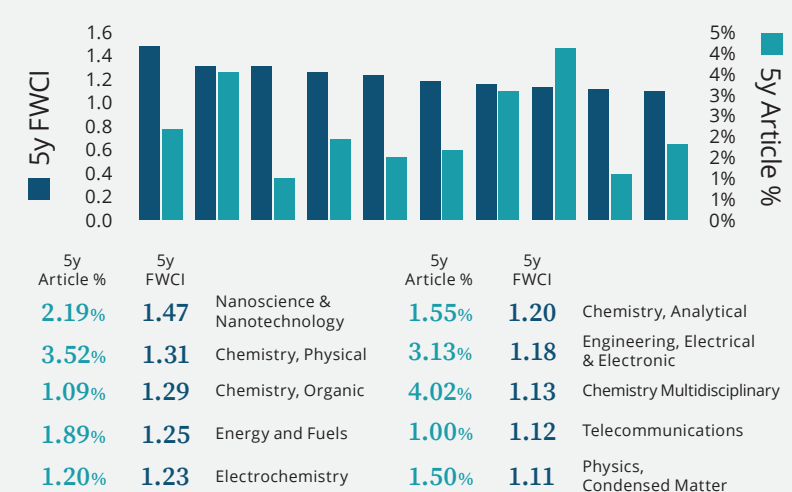


Figure 8. Top 10 fast-growing Subjects⁴ Comparison: CAGR & Article % (2013–2017)



Source: WoS, QlikSense Country and Subject Comparison: FWCI Dashboard | ⁴The subject areas which have less than 1% article share in China (# of subject articles/# of China articles) have not been included.