Will China stay centre-stage for international research collaboration?

As global research emerges from the fog of the pandemic, new influential networks are being formed.

It is illustrative of the tectonic shifts in global science in the past decade that any assessment of the international research ecosystem is now incomplete without considering the role played by China. It produces the largest volume of international publications in science and engineering and has surpassed the United States in some measures of most-cited papers. According to the latest Nature Index data, China is now top for Share in natural-science journals and is the largest or second largest collaborator for the United States, Australia, Germany, Japan, South Korea, Singapore and many other countries.

Nature Index data also confirm a pattern that other research on global scientific collaboration has already identified: that internationally co-authored publications involving China are on the decline, particularly with the United States (see page S9).

There are several reasons behind this. Geopolitical tensions between China and the United States — the New Cold War — is one major factor, leading to a chilling effect on research cooperation and the movement of academics between the countries. In the United States, a survey of around 2,000 academics found that 42% of Chinese researchers felt racially profiled by the US government, which under President Donald Trump launched an initiative to clamp down on perceived economic espionage by China (X. Li and J. Lee *Int. High. Educ.* Issue 110, 21–22; 2022). Researchers and students from China also faced challenges in obtaining visas to visit the United States. In the United Kingdom and Australia, questions over research collaborations with China also rose, often associated with concerns about national security.

In China, concerns over Westernization always exist, not only in society, but also in research, and they have intensified amid geopolitical tensions. In the past three years, the Chinese government has tried to strike a greater balance between international and domestic research. A series of national policies issued in 2020 discouraged the overemphasis on publications in international journals. Chinese researchers were urged to 'write papers on the homeland', quoting a speech by President Xi Jinping, rather than trying to always publish internationally.

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Xin Xu is a research fellow at the Centre for Global Higher Education, based at the Department of Education, University of Oxford, UK.
e-mail: xin.xu@education.ox.ac.uk

The COVID-19 pandemic also played a role. Online engagement became crucial for international collaborations, but Internet censorship in China made this much more challenging. Making international Zoom calls and using Google, for instance, were difficult. Students and academics from outside China who attended and worked at Chinese universities had difficulty crossing the border. Many left the country during that period.

The world is now changing again. With China finally lifting lockdowns and reopening its border, will we see a return to international research collaboration? In my view, it is likely. China has collaborated internationally in science since its 'reform and opening-up' began in 1978, with this internationalization being central to its higher-education and research development. In the 1980s and 1990s, China's engagement with the world started by mainly learning from the West. But more recently, Chinese institutions and researchers have taken on more active and leading roles in global research. As a result, with mobility restrictions ceasing, international engagements will probably revive.

The United States and China are, despite the downturn in collaborations, still the two largest science powerhouses, with long-term and intense partnerships. They are likely to remain top collaborators in the short to medium term, but China's networks might be more diversified. China has been actively establishing and consolidating partnerships with countries outside of the major Western powers. Efforts have involved government-led programmes such as the Belt and Road Initiative, aimed at enhancing links with countries across Asia, Europe, Africa and Latin America, and bottom-up people-to-people networks. Activities include governmental collaboration agreements, funding and investment, infrastructure building and mobility programmes, such as student and academic exchanges. As of 2020, students from Belt and Road countries accounted for 46.9% of all international students studying in China.

By 2022, under the Belt and Road Initiative, China had established formal scientific partnerships with 84 countries, funded 1,118 collaborative projects and established 53 joint laboratories in areas such as new energy and health. Comparing the periods 2006–10 and 2011–15, co-authored papers between China and Organisation for Economic Co-operation and Development (OECD) countries, as well as China and the European Union, grew by only 1.2 times. By contrast, co-authored papers between China and the Middle East had the highest growth ratio (3.9), followed by China and Africa (2.9), China and Latin America (2.0) and China and Belt and Road countries (1.6).

China's decoupling from the United States, or the West more generally, does not mean decoupling from the world. Even if the decline in collaboration between China and the United States creates some risks for global scientific collaboration, it also indicates a more diversified research landscape. This is important because tackling global challenges, such as climate change and disease, requires the cooperation of all countries.