



Commercial Monopoly or Open Research: China's National Knowledge Infrastructure

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Twenty-first century academia is marked by the wide use of academic research databases and their dominance in academic publishing. English-speaking researchers are familiar with major databases, including Web of Science and Scopus. In many non-English speaking regions/countries, databases in local languages have emerged to serve the needs of local researchers. A distinctive example is the China National Knowledge Infrastructure (CNKI), the largest research database in China.

These databases have made significant contributions to promoting knowledge dissemination and academic exchange. However, their development is a double-edged sword. High commercial pricing and suspected monopoly/oligarchy are *de facto* building walls between academia and the general public, and are against open research. While calls for open research are growing clearer and louder worldwide, various players, both inside and outside academia, are facing difficulties in making it a reality. This article focuses on ongoing efforts in China in favor of open research, in response to the dominance of CNKI, and reflects on possible approaches to promoting open research.

CNKI and Its Dominance in China

As the largest knowledge collection and sharing platform in China, CNKI has been an important player in the development of Chinese academia. Established in June 1999 by Tsinghua University and its affiliated business, Tongfang Co. Ltd., then a state-owned company, CNKI was founded with the aim of supporting knowledge innovation, learning, and application. CNKI was recognized and strongly supported by China's central government at its inception. It was listed as a key innovation project in the field of science and technology and was included in the China Torch Program, a national plan to develop China's high-tech industry. CNKI was transformed from a state-owned entity into a private company in 2014, and it became a limited liability company controlled by state-owned enterprise in 2019. Despite these multiple transformations, CNKI has maintained its dominance in the field of academic resources in China. The operating model of CNKI is to purchase academic material (including papers, yearbooks, dissertations, and newspapers) from publishers, journals, and universities, and sell digital knowledge products through subscriptions and relevant services. CNKI does not publish journals or papers.

As of 2022, CNKI includes more than 95 percent of all officially published Chinese academic resources and more than 200 million domestic and international journal documents, making it the dominant player in the Chinese academic resource market. Its website displays a database of over 1,600 overseas institutional customers from 60 countries and regions, and 32,000 institutional customers from various industries in the Chinese mainland. CNKI also actively participates in the evaluation of academic journals in China. Each year, it publishes the *Annual Report on the Impact Factor of Chinese Academic Journals*, which is often referred to in performance reviews at Chinese higher education institutes. All these practices make CNKI a seemingly inseparable part of Chinese academia. Notably, the development of CNKI is *per se* also a sign of the pluralization of languages in global academic publishing, which is conducive to increased global epistemic diversity and justice.

Abstract

Developing research databases is a double-edged sword. Research databases may promote knowledge exchange, but their monopolistic/oligarchist practices are also building walls. Taking as an example the largest research database in China, the China National Knowledge Infrastructure, this article discusses the growing boycotts against the commercial monopoly of research databases in academia and reflects on the future of open research. It calls for concerted efforts from the whole research community.

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Boycotts against CNKI in China

Despite the success of CNKI, there are growing concerns about its monopolistic practices. In April 2022, the Chinese Academy of Sciences (CAS), a top research organization in China, announced its decision to end its subscription to CNKI and search for alternative databases as a replacement. The main reason behind the decision was the increase in subscription fees requested by CNKI. According to Wuhan University of Technology, which temporarily suspended its subscription to CNKI in 2016, its subscription fees to CNKI soared by 132.86 percent from 2010 to 2016. This increase is reflected in CNKI's revenue. The 2021 *Financial Report* of Tongfang Co. Ltd. shows that CNKI's revenue was USD 192 million, with a gross margin of 53.35 percent. (Yet, CNKI's revenue falls short of its international counterparts, an indication of the high level of profit of commercial research databases in general. For example, in 2019, Elsevier's parent company RELX, which runs one of the largest research databases in English, Scopus, had a revenue of USD 9.8 billion, compared to CNKI's revenue of USD 149 million. But the difference might partly be due to Elsevier's publishing of journals, which brings in significant revenue.)

This tossed stone raised a thousand ripples. Shortly after CAS' announcement, CNKI's high subscription fees became a headline in China, attracting wide criticism. It reminded the public of continuous attempts by Chinese higher education institutes, in recent years, to boycott CNKI. In the past decade, at least six universities, including Peking University and Wuhan Institute of Technology, temporarily suspended their subscriptions to CNKI. But none of these suspensions lasted long: All institutions resumed their subscriptions after failing to find adequate alternatives.

Nonetheless, these efforts were not totally in vain. After negotiations, CNKI agreed to reduce subscription fees for certain institutions, though not substantially. For example, Nanjing University managed to get a reduction of USD 7,460 from the budgeted price of USD 161,136 for the 2022 subscription fees. In May 2022, the Chinese government launched an antimonopoly investigation against CNKI. While the investigation was still in progress at the time of writing this article, it was hoped that public attention and the investigation would bring about changes and open the field to new players.

These efforts are not unique to China. In January 2017, German universities and research institutions criticized the high pricing policy of Elsevier and had rounds of negotiations with the company in order to cut down subscription fees. In June 2020, MIT put an end to its negotiations with Elsevier regarding a new journal subscription contract of around 700 journals, which would have cost more than USD 2.7 million.

Calling for Open Research: Common Good vs. Profit Making

As a result of the obstinate monopolistic/oligarchic practices of large research databases worldwide, an essential question emerges: What is the future of open research and how can it be achieved? We argue that a major obstacle to open research is the tension between the common-good nature of knowledge and the profit-making nature of commercial publishers and research databases.

The discussion above shows that isolated efforts by single institutions often lead to failures. As the common-good idea suggests, only concerted common efforts by the whole research community could arguably make a difference. This calls for all institutions and researchers joining hands in promoting open knowledge sharing. There have already been repeated attempts in this regard. For example, the emergence of free and open academic exchange platforms, including ResearchGate, Stanford University's High-Wire E-journal Press, and the University of Michigan's Thesis Repository, points to possible means to bypass high-pricing research databases. However, such platforms can face copyright problems. Dealing with such problems is key. In addition, though the common-good idea does not necessarily require the state to get involved, it is still within the state's remit to fight against monopoly and promote the common good. The next question is to what extent the state should get involved in order to maintain an autonomous research space. ▲

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