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China's Science Funding

THIS YEAR MARKS THE 25TH ANNIVERSARY OF THE NATIONAL NATURAL SCIENCE FOUNDATION of China (NSFC), the largest funding agency for basic research in the country. On this occasion, the leadership of the NSFC and the Chinese Ministry of Finance arranged for the NSFC to be reviewed by an International Evaluation Committee (IEC), which sets a new precedent for China. Part of the motivation for this review was a desire on the part of the Chinese government to determine how well their extensive efforts to boost the support of scientific research measure up to international standards. Apart from logistical arrangements, the IEC was completely independent in its operations. An “evidence-based review” (that is, an overview with extensive data) was carefully prepared by China's National Center for Science and Technology Evaluation. We were also given access to anyone with whom we wanted to speak, including those critical of the present Chinese research culture. Both the evidence-based review and the full report, with our comments and recommendations, are accessible online (www.nsf.gov.cn/english/13rp/index.html). The process and results of this report should be useful not only for China but also for many other nations striving to produce a merit-based culture for science.

We believe that a periodic external review of a nation's research-funding mechanisms is of immense benefit, not only to the country concerned but also to all those who interact with its scientists. There are many different ways in which problems can arise to reduce the effectiveness with which valuable national resources are distributed to support scientific research. Often, management has already identified potential directions for improvement, as in the case of the NSFC. Nevertheless, when an international group of respected experts confirms these desired directions for change, this can produce outcomes that management alone cannot achieve.

Almost everyone we talked to—researchers inside and outside China, university administrators, applicants whose proposals were accepted or rejected, and representatives of various Chinese ministries—was of the opinion that the research-funding mechanisms of the NSFC are “the best in China.” The NSFC processes its applications by means of peer review, the form of review that we consider to be the best practice internationally. This is a significant achievement, given that the Chinese research system had to start nearly from scratch a quarter of a century ago and underwent extremely rapid growth, so that the number of potential applicants is now huge.

We advised the NSFC to focus its attention on several areas where improvements could further increase its effectiveness. Compared to similar institutions elsewhere, it is clear that the number of NSFC staff needs to be substantially increased to handle the ever-increasing number of research applications. In addition, we recommend that drastic steps be taken to reduce the number of proposals submitted. There is also a need to promote early-career researchers, as well as to provide considerably more flexibility in the way that researchers can use their resources after a grant is awarded. The NSFC also needs to improve its assessment of interdisciplinary proposals. Enhanced attention should be given to conflict-of-interest issues. For example, in response to complaints from active researchers, we advised the NSFC to restrict the tenure of panel members and to broaden the composition of grant evaluation panels to include early-career scientists, female researchers, and international members. Increasing internationality remains a key challenge for China, although the NSFC has already made commendable efforts in this respect.

The innovations that the Chinese economy would like to stimulate will require breakthroughs in basic research which, in turn, must have sustainable funding. There is no doubt that the NSFC deserves strong increases in its budget. We also hope that the model of the NSFC might be transferable to other granting agencies in China, thereby improving the entire Chinese research culture.

– Richard N. Zare and Ernst-Ludwig Winnacker

