SHANGHAI ASSOCIATION FOR SCIENCE & TECHNOLOGY

Q&A David Sweeney

The numbers game

David Sweeney, a director of the Higher Education Funding Council for England (HEFCE), outlines the importance of accurately assessing the benefits of academic research and the dividends it can bring.

How do China and the United Kingdom differ in their methods of evaluating and funding research?

For half of the higher-education assessment and funding in the United Kingdom, we don't make judgements about individual projects. We fund as a block grant without specifying what the money should be spent on. This means that a university can earn money because of its excellence in physics and spend it on drama. My understanding is that the Chinese approach involves more direction concerning the disciplines and institutions that the money will be spent on.

The United Kingdom's competitive research grant system is, of course, based on judgements, but those judgements are made solely by discipline experts. The only role for centralized planning by government is in the area of capital expenditure. Overall, the government and research funders cede the judgements to either discipline experts in the research councils or to university management.

Should China take inspiration from the United Kingdom in its efforts to reform its research assessment and funding systems, or vice versa?

The UK system is relatively mature. We've been conducting research in universities for a very long time, and we've been doing it in the way we do it now for at least 25 years. We are not on the whole trying to build research capacity.

Our system serves us well and suits our culture, but that doesn't necessarily mean it is right for another country. The real question is: should you do things differently in a research system that is in the process of establishing itself? At the 2014 International Symposium on Research Assessment and Evaluation, held in Shanghai and co-hosted by *Nature* (see page S8), I was very taken by some of the honest comments about how twentieth-century Chinese history affects the nation's research structures, notably how the age cohorts of the researchers in China essentially reflect historical events such as the Cultural Revolution. We have nothing like that in our recent history that has changed the way we do things in the United Kingdom. It's quite tricky to compare assessment and funding systems when the environments are so different.

What other countries have unusual ways of directing and funding their research efforts?

One extreme example is Singapore, which has a highly planned and directed system. Singapore is seeking to build very strong research organizations and is offering significant incentives to encourage the best brains to go and work there. Another interesting case is Australia, which targets its research resources in its strongest areas, such as environmental science, or those in which there is considerable national need, which in the recent past has included production methods that can accommodate competing demands for soil and water.

You also have to make a judgement about whether one of the purposes of research is to support broader innovation and business. The United Kingdom is second only to Switzerland in the Global Innovation Index 2014 (an annual ranking of countries by innovation metrics). So depending on what they are trying to achieve, countries may need to look beyond their research funding systems, perhaps to associated ways to translate research into jobs and other economic benefits to achieve the biggest impact.

Should other countries be worried that China has increased its research and development funding by an average of 23% per year for the past decade?

The United Kingdom is fortunate enough to be extremely productive, which is partly because of the maturity of our system. If we want to maintain our current position, then we have to ask: 'Are we are investing enough?'; and 'If we maintain our current level of investment, will the best people be attracted to work elsewhere because of the greater investment that others are making?' Our success is partly due to the people we attract from other countries, so yes, there is a threat posed by others having more funds for investment. We have to consider at every stage whether we have sufficient resources to attract and support the best people.

To what extent is China's rapid rise in high-quality research output a direct consequence of its sustained increases in funding?

I'm sure that increased investment supports that and I'm also sure that there are other factors in play, but we don't yet have enough evidence to understand what those factors are. It would be helpful to understand not just the role of increased investment on results, but also how you get those results. We could all learn about using money more effectively.

Should other countries follow China's example by increasing research funding?

You've got to do analysis on what the outputs of your research are, whether that is publications or new technologies. It's always good to invest in developing new knowledge but there is competition for scarce funds from other areas such as education, health and defence. You can only determine whether the potential benefits are worth a proposed increase in investment based on the particular problems a country is facing and on the productivity of your research system. If a country's productivity is low, it might be difficult to justify additional investment in academic research. ■

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