

# Funding in the firing line

Do governments have a duty to fund the full spectrum of scientific research, or can the private sector be relied upon to pick up the slack?

Howard Wolinsky

Towards the end of 2010, with the British economy reeling from the combined effects of the global recession, the burst bubble of property speculation and a banking crisis, the country came close to cutting its national science and research budget by up to 25%. UK Business Secretary Vince Cable argued, “there is no justification for taxpayers’ money being used to support research which is neither commercially useful nor theoretically outstanding” (BBC, 2010). The outcry from UK scientists was both passionate and reasoned until, in the end, the British budget slashers blinked and the UK government backed down. The Chancellor of the Exchequer, George Osborne, announced in October that the government would freeze science and research funding at £4.6 billion per annum for four years, although even this represents about a 10% cut in real terms, because of inflation.

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There has been a collective sigh of relief. Sir John Savill, Chief Executive of the Medical Research Council (UK), said: “The worst projections for cuts to the science budget have not been realised. It’s clear that the government has listened to and acted on the evidence showing investment in science is vital to securing a healthy, sustainable and prosperous future.”

Yet Britain is unusual compared with its counterparts elsewhere in the European Union (EU) and the USA, because private charities, such as the Wellcome Trust (London, UK) and Cancer Research UK (London, UK), already have budgets that rival those of their government counterparts. It was this fact, coupled with UK Prime Minister David Cameron’s idea of the ‘big

society’—a vision of smaller government, increased government–private partnerships and a bigger role for non-profit organizations, such as single-disease-focused charities—that led the British government to contemplate reducing its contribution to research, relying on the private sector to pick up the slack.

Jonathan Grant, president of RAND Europe (London, UK)—a not-for-profit research institute that advises on policy and decision-making—commented: “There was a strong backlash and [the UK Government] pulled back from that position [to cut funding]. But that’s the first time I’ve really ever seen it floated as a political idea; that government doesn’t need to fund cancer research because we’ve got all these not-for-profits funding it.”

But the UK was not alone in mooting the idea that research budgets might have to suffer under the financial crisis. Some had worried that declining government funding of research would spread across the developed world, although the worst of these fears have not been realized.

Peter Gruss, President of the Max Planck Society (Munich, Germany), explained that his organization receives 85% of its more-than €1.5 billion budget from the public purses of the German federal government, German state ministries and the EU, and that not all governments have backed away from their commitment to research. In fact, during the crisis, the German and US governments boosted their funding of research with the goal of helping the economic recovery. In 2009, German Chancellor Angela Merkel’s government, through negotiation with the German state science ministries, approved a windfall of €18 billion in new science funding, to be spread over the next decade. Similarly, US President Barack Obama’s administration boosted spending on research with a temporary stimulus package for science, through the American Recovery and Reinvestment Act.

Even so, Harry Greenberg, Senior Associate Dean for Research at Stanford University (California, USA) pointed out that until the US government injected stimulus funding, the budget at the National Institutes of Health (NIH; Bethesda, Maryland, USA) had essentially “been flat as a pancake for five or six years, and that means that it’s actually gone down and it’s having an effect on people being able to sustain their research mission.”

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Similarly, Gruss said that the research community should remain vigilant. “I think one could phrase it as there is a danger. If you look at Great Britain, there is the Wellcome Trust, a very strong funding organization for life sciences and medical-oriented, health-oriented research. I think it’s in the back of the minds of the politicians that there is a gigantic foundation that supports that [kind of research]. I don’t think one can deny that. There is an atmosphere that people like the Gates family [Bill and Melinda Gates Foundation] invests in health-related issues, particularly in the poorer countries [and that] maybe that is something that suffices.”

The money available for research from private foundations and charities is growing in both size and scope. According to Iain Mattaj, Director General of the European Molecular Biology Laboratory (EMBL; Heidelberg, Germany), this growth might not be a bad thing. As he pointed out, private funding often complements government funding, with charities such as the Wellcome Trust going out of their way to leverage government spending without reducing government contributions. “My feeling is that the reason that the UK government is freezing research funding has all to do with economics and nothing to do with the fact that there are potentially private funders,” he said. “Several very large charities in particular are putting a lot of money into health research. The Gates Foundation is the biggest that has just come on the scene, but the Howard Hughes Medical Institute [HHMI; Chevy



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Chase, Maryland, USA] and the Wellcome Trust are very big, essentially private charities which have their own agendas.”

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But, as he explained, these charities actually contribute to the overall health research budget, rather than substituting funds from one area to another. In fact, they often team up to tackle difficult research questions in partnership with each other and with government. Two-thirds of the €140 million annual budget of EMBL comes from the European states that agree to fund it, with additional contributions from private sources such as the Wellcome Trust and public sources such as the NIH.

Yet over the years, as priorities have changed, the focus of those partnerships and the willingness to spend money on certain research themes or approaches has shifted, both within governments and in the private sector. Belief in the success of US President Richard Nixon’s famous ‘war on cancer’, for example, has waned over the years, although the fight and the funding continues. “I don’t want to use

the word political, because of course the decisions are sometimes political, but actually it was a social priority to fight cancer. It was a social priority to fight AIDS,” Mattaj commented. “For the Wellcome Trust and the Gates Foundation, which are fighting tropical diseases, they see that as a social necessity, rather than a personal interest if you like.”

Nevertheless, Mattaj is not surprised that there is an inclination to reduce research spending in the UK and many smaller countries battered by the economic downturn. “Most countries have to reduce public spending, and research is public spending. It may be less badly hit than other aspects of public spending. [As such] it’s much better off than many other aspects of public spending.”

A shift away from government funding to private funding, especially from disease-focused charities, worries some that less funding will be available for basic, curiosity-driven research—a move from pure research to ‘cure’ research. Moreover, charities are often just as vulnerable to economic downturns, so relying on them is not a guarantee of funding in harsh economic times. Indeed, greater reliance on private funding would be a return to the era of ‘gentlemen scientists’ and their benefactors (Sidebar A).

Janet Rowley, a geneticist at the University of Chicago, is worried that the change in funding will make it more difficult to obtain money for the kind of research that led to her discovery in the 1970s of the first chromosomal translocations that cause cancer. She calls such work ‘fishing expeditions’. She said that the Leukemia & Lymphoma Society (White Plains, New York, USA), for example—a non-profit funder of research—has modified its emphasis: “They have now said that they are going to put most of their resources into translational work and trying to take ideas that are close to clinical application, but need what are called incubator funds to ramp up from a laboratory to small-scale industrial production to increase the amount of compound or whatever is required to do studies on more patients.”

**...if neither charities nor governments are willing to fund basic research, then who will pay the bill?**

This echoes Vince Cable’s view that taxpayers should not have to spend money on research that is not of direct economic, technological or health benefit to them. But if neither charities nor governments are willing to fund basic research, then who will pay the bill?

**Sidebar A | Gentlemen scientists**

Greater reliance on private funding would return science to a bygone age of gentlemen scientists relying on the largesse of their wealthy sponsors. In 1831, for example, naturalist Charles Darwin's (1809–1882) passage on the HMS Beagle was paid for by his father, albeit reluctantly. According to Laura Snyder, an expert on Victorian science and culture at St John's University (New York, USA), by the time Darwin returned to England in 1836, the funding game had changed and government and private scientific societies had begun to have a bigger role. When Sir John Frederick William Herschel (1791–1871), an English mathematician, astronomer, chemist, experimental photographer and inventor, journeyed to Cape Colony in 1833, the British government offered to give him a free ride aboard an Admiralty ship. "Herschel turned them down because he wanted to be free to do whatever he wanted once he got to South Africa, and he didn't want to feel beholden to government to do what they wanted him to do," Snyder explained, drawing from her new book *The Philosophical Breakfast Club*, which covers the creation of the modern concept of science.

Charles Babbage (1791–1871), the mathematician, philosopher, inventor and mechanical engineer who originated the concept of a programmable computer, was a member of the same circle as Herschel and William Whewell (1794–1866), a polymath, geologist, astronomer and theologian, who coined the word 'scientist'. Although he was wealthy, having inherited £100,000 in 1827—valued at about £13.3 million in 2008—Babbage felt that government should help pay for his research that served the public interest. "Babbage was asking the government constantly for money to build his difference engine," Snyder said. Babbage griped about feeling like a tradesman begging to be paid. "It annoyed him. He felt that the government should just have said, 'We will support the engine, whatever it is that you need, just tell us and we'll write you a check'. But that's not what the government was about to do."

Instead, the British government expected Babbage to report on his progress before it loosened its purse strings. Snyder explained, "What the government was doing was a little bit more like grants today, in the sense that you have to justify getting more money and you have to account for spending the money. Babbage just wanted an open pocketbook at his disposal."

In the end the government donated £17,000, and Babbage never completed the machine.

Iain Mattaj believes that the line between pure research and cure research is actually too blurred to make these kinds of funding distinctions. "In my view, it's very much a continuum. I think many people who do basic research are actually very interested in the applications of their research. That's just not their expertise," he said. "I think many people who are at the basic end of research are more than happy to see things that they find out contributing towards things that are useful for society."

**"Basic discovery is the grist for the mill that leads to translational research and new breakthroughs"**

Jack Dixon, Vice President and Chief Scientific Officer at HHMI, also thinks that the line is blurry: "This divide between basic research and translational research is somewhat arbitrary, somewhat artificial in

nature. I think every scientist I know who makes important, basic discoveries likes to [...] see their efforts translate into things that help humankind. Our focus at the Hughes has always been on basic things, but we love to see them translated into interesting products." Even so, HHMI spends less than US \$1 billion annually on research, which is overshadowed by the \$30 billion spent by the NIH and the relatively huge budgets of the Wellcome Trust and Cancer Research UK. "We're a small player in terms of the total research funding in the US, so I just don't see the NIH pulling back on supporting research," Dixon said.

By way of example, Brian Druker, Professor of Medicine at the Oregon Health & Science University (Portland, Oregon, USA) and a HHMI scientist, picked up on Rowley's work with cancer-causing chromosomal translocations and developed the blockbuster anti-cancer drug, imatinib, marketed by Novartis. "Brian Druker is one of our poster boys in terms of the work he's

done and how that is translated into helping people live longer lives that have this disease," Dixon commented.

There is a similar view at Stanford. The distinction between basic and applied is "in the eye of the beholder," Greenberg said. "Basic discovery is the grist for the mill that leads to translational research and new breakthroughs. It's always been a little difficult to convey, but at least here at Stanford, that's number one. Number two, many of our very basic researchers enjoy thinking about the translational or clinical implications of their basic findings and some of them want to be part of doing it. They want some benefit for mankind other than pure knowledge."

If it had not backed down from the massive cuts to the research budget that were proposed, the intention of the UK Government to cut funding for basic, rather than applied, research might have proven difficult to implement. Identifying which research will be of no value to society is like trying to decide which child will grow up to be Prime Minister. Nevertheless, most would agree that governments have a duty to get value-for-money for the taxpayer, but defining the value of research in purely economic or translational terms is both short-sighted and near impossible. Even so, science is feeling the economic downturn and budgets are tighter than they have been for a long time. As Greenberg concluded, "It's human nature when everybody is feeling the pinch that you think [yours] is bigger than the next guy's, but I would be hard pressed to say who is getting pinched, at least in the biomedical agenda, more than who else."

**CONFLICT OF INTEREST**

The author declares that he has no conflict of interest.

**REFERENCE**

BBC (2010) Vince Cable reveals a strategy to cut science funding. <http://www.bbc.co.uk/news/business-11225197>

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