EDITORIAL

nature cell biology

# Funding boom or bust?

**The impact of the continuing economic woes on science funding remains uncertain. Surprisingly, the crisis may actually reinvigorate research. Investment in science and education is a prerequisite not only for emergence from the economic downward spiral, but also for addressing pressing global needs.**

The global economic meltdown is leaving everyone jittery, particularly as it has revealed fundamental flaws in the deregulated banking sector and because its severity was not predicted by most experts. Will research and higher education be hit as hard as most industries?

Science may actually fare reasonably well: many governments in Europe, the US and Asia have pledged unprecedented economic stimulus packages. For example, the US Senate has just approved a one-off $838 billion package (in addition to the proposed bank bail-out injection of $1.5 trillion). The aim is to reduce unemployment and get money circulating back in the economy, while investing in projects with long-term societal and financial benefits. In previous recessions, rescue packages have focused on infrastructure projects. Recently, however, many politicians have accepted that education and technological innovation will provide the most significant long-term economical benefits. In the US, the crisis has fortuitously coincided with the arrival of a president who recognizes the value of scientific research: Barack Obama pledged in his inauguration, "I will restore science to its rightful place." It has also helped that there has been an increasing global realization, notably in the US and China, the two largest emitters of greenhouse gases, that action on climate change must not be delayed and research into cause, effect and solutions has to be a priority.

The House of Representatives earmarked approximately $15 billion of the stimulus package for federal research over two years, the National Science Foundation and the National Institutes of Health (NIH) are to receive $3 and $3.5 billion, respectively, of which more than half is to be spent directly on research. However, it is unlikely that one cash injection will reinvigorate US science funding, which continues to be in a depressed state despite Bush's 2007 American Competitiveness Initiative. Commenting on the stimulus package, Elias Zerhouni, former NIH director, observed, "it's short-term wise, but long-term ineffective." The extent to which this renewed focus on scientific research will be reflected in President Obama's 2010 budget remains to be seen.

In the US and elsewhere, charities and endowments have been hit hard by global stock market devaluations and by the drying-up of both charitable donations and corporate sponsorship. The Wellcome Trust has lost 13.2% this year (although grants will be cut by only 4.8%), while the Howard Hughes Medical Institute lost 6.4%. More worryingly, Cancer Research UK has deferred its next round of funding. US University endowments, such as those of Harvard and Yale, have fallen by up to 30%. The University of California announced $100 million in spending cuts and Stanford University is planning a 5% decrease in spending. Hiring, salary or infrastructure freezes have been implemented at half of all independent US Universities, including Harvard and Cornell. However, before despairing it is important to remember that stocks may at least partially recover, that charities can compensate by trimming assets and that this is certainly not the first time charities and endowments have been ravaged by a stock market decline.

Biotechnology start-ups in particular face a real challenge, as venture capital firms are likely to shift investments to safer ground. To make matters worse, 180 quoted US biotechnology companies have less than a year of cash left. However, whereas total US healthcare investments fell significantly in the last quarter of 2008, the NASDAQ Biotechnology Index lost only 12% last year (compared with 41% for the NASDAQ stock market as a whole). Indeed the life sciences continue to be viewed as a safe investment by the majority of US venture capitalists questioned in a recent survey. Furthermore, mergers and acquisitions also remain healthy due to the pipeline problems of big pharma and good deals on cash-strapped start-ups. European biotechnology companies may fare worse; Willy de Greef, head of trade organization EuropaBio, predicts 2009 could be a "bloodbath". In the UK, a consortium of biotechnology companies is lobbying the government to create a public–private partnership fund, while in the US such companies are pushing for tax relief.

A report just released by the European Union indicates that between 2000 and 2006 its research work-force grew twice as fast as that of the US, although average R&D spending has remained at 1.84% of GDP since 2005, well behind the 2010 target of 3% (notably, France and the UK actually reduced their 'R&D intensity'). This is behind Japan at 3.39%, Korea at 3.23% and the US at 2.61% (2006 levels). It remains to be seen whether European governments are prepared to focus stimulus injections on research and to get back on track to meet the R&D spending target of the 2002 Barcelona accord. In Austria, for example, plans were leaked last month suggesting that up to 40% of the current science budget may fall victim to the financial crisis. It would be tremendously short-sighted to sacrifice recent gains in research investment to prop up an ailing banking sector. One can be cautiously optimistic that the European Union will act in line with the advice of its Research Commissioner Janez Potočnik, as its core €50 billion 'Seventh Framework Programme' for research is set to continue unscathed. He commented only last year that, "less investment in science and innovation would only turn this hopefully manageable crisis into a long-term structural problem for Europe."

Budget cuts and hiring freezes in academic institutions are not a viable solution. Such a strategy would accelerate a long-term economic downward spiral, while preventing essential progress in healthcare and climate issues. Without government intervention, R&D funding will be significantly reduced this year. Total R&D spending in the US, Europe and Asia rose at a fairly steady pace through the smaller recessions of the 1980s and 1990s. It is important to achieve the same on this occasion. It is equally important to ensure that science funding retains an international outlook, as closing national borders would hinder progress and resolution of this global crisis. Now is the time to focus lobbying efforts on communicating the positive message that education and research should be the cornerstone of any far-sighted strategy to exit the economic downturn.