

SCIENCE AND TECHNOLOGY

Winning the Race 2012 is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage.

Context and Policy Divide

Innovation powers competitiveness and boosts living standards. Science and technology, in turn, are key enablers of innovation. This premise helped drive robust federal investment in science and technology in the 1960s, 70s, and 80s that fueled our post-war prosperity. It set the stage for the IT revolution, advances in life sciences, and the creation of millions of jobs and thousands of companies in the 1990s. But today we are shortchanging our future. The United States is now just eighth among OECD countries in R&D as a share of GDP. A key reason is that federal R&D investment grew in constant dollars at just 0.3 percent per year from 1987 to 2008. To restore federal support for research as a share of GDP to 1987 levels, we would have to increase federal funding by almost \$110 billion per year. Unfortunately, we are moving in the opposite direction. Fiscal hawks want to put “everything on the table” when cutting the budget, even federal support for science. Many policymakers (usually, but not exclusively, Republicans) are wary of government funding for applied research and technology commercialization and prefer to confine public funding to basic science. While most Democrats are more willing to support R&D funding, too often they are willing to trade it off for increased social welfare spending. If we are to once again become a globally competitive innovation economy we will need to do what other nations are doing: boost public investment in research and put in place new efforts to spur commercialization of this research.

Innovation Race Principles

- **Public investment in research fuels a robust innovation economy.** The scholarly evidence clearly shows that government R&D funding is a complement to, not a substitute for, private sector R&D funding. Industry is able to build on the knowledge and understanding of discoveries from publicly supported research, making their own research more effective. These “spillovers” provide firms with a common platform of basic knowledge, and thus precipitate even greater levels of innovation. In general, an additional dollar of public research added to the stock of government R&D has the effect of inducing an additional twenty-seven cents of private R&D investment.
- **Government plays a key role in both basic and applied research.** The notion that government should only fund basic research makes little sense in the new global

economy. The results of basic research are more easily appropriated by firms in other nations and used to gain competitive advantage, so it is critical that the federal government also supports applied research. Moreover, we should not assume U.S. firms undertake adequate levels of applied research but not basic research. From 1991 to 2008, basic and applied research as a share of corporate R&D both fell by about 3.6 percentage points.

- **Funding research is not enough, federal policy needs to support its commercialization.** The federal system for funding research pays too little attention to commercialization and is still based on the linear model that assumes basic research gets easily translated into commercial activity by market forces. In fact, the commercialization process is choked with barriers and “valleys of death.” Federal policy needs to explicitly address the challenges in getting ideas from lab to market.

Policy Recommendations

- ✓ **Increase overall federal funding for research by \$20 billion per year:** Doing so would move the United States to second place in the world, behind Austria, in government funding of research as a share of GDP.
- ✓ **Boost NIH Funding to 0.25 percent of GDP:** The United States must not squander its advantages in the vast frontier of life sciences. Despite the commitment by Congress to double the budget of the National Institutes of Health (NIH), funding for NIH peaked in 2003 at 0.24 percent of GDP and has fallen to 0.19 percent today. These trends contrast starkly with those in many other countries that have put expanding life science research at the top of their innovation agendas. The next Administration should push for an increase in NIH funding by approximately \$8 billion dollars per year over the next few years.
- ✓ **Direct more federal funding to commercialization:** Federal labs and universities face only weak incentives to commercialize research. Congress should direct approximately half the increase in federal funding for research to be allocated to universities and federal labs on the basis of their success in bringing research to market. Tying increased funding to commercialization performance would reward the universities and labs that do a good job and encourage others to improve.
- ✓ **Establish a National Innovation Foundation:** Other countries exceed the United States in direct funding of innovation-promotion efforts. Most of our competitors have established free-standing national innovation foundations, akin to their science agencies, but focused on innovation. At the end of the day, the National Science Foundation is a university science agency, not an innovation or technology agency. Therefore, the federal government should establish a National Innovation Foundation—a nimble, lean, and collaborative entity devoted to supporting firms and other organizations in their innovative activities.

- ✓ **Pay for funding increases by repealing the mortgage interest deduction:** Eliminating the deduction would reduce tax expenditures by approximately \$90 billion per year while increasing the incentives for Americans to save by paying off their mortgages ahead of schedule (thus boosting national savings). If one quarter of the savings was used to fund a first-time home buyers tax credit, and one half used for deficit reduction, the remaining one-quarter could be used to fund increases in federal support for research.

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The United States is losing the race for global innovation advantage and the jobs and income that come with that. Many other nations are putting in place better tax, talent, technology and trade policies and reaping the rewards of higher growth, more robust job creation, and faster income growth. It's not too late for the United States to regain its lead but the federal government will need to act boldly and with resolve to design and implement strategies that include cutting business taxes and boosting public investment. *Winning the Race 2012* is a series of ten policy briefs that lay out broad principles and actionable ideas for the next administration to embrace to help the United States win the race for global innovation advantage. For more actionable policy ideas, visit ITIF's *Policymakers Toolbox* at www.itif.org/policymakers-toolbox.

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