Federal Investment in Science Fuels America's Global Leadership

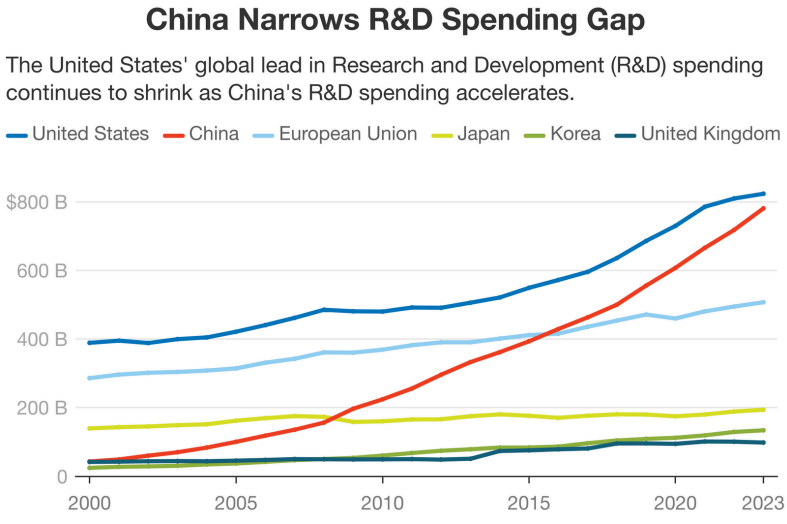
America's leadership in science, technology, talent, and innovation is at risk. Inadequate federal investment in research has slowed the United States' economic growth and opened the door for competitors to gain ground in critical areas of science and technology. Leadership in advanced fields like artificial intelligence and quantum computing is shifting to China. To reverse this trend and secure our global position, robust funding for our key science agencies – the National Institutes of Health (NIH), the National Science Foundation (NSF), the Department of Defense (DOD), the Department of Energy (DOE) Office of Science, and NASA – is essential. Both Congress and the administration have expressed a commitment to maintaining America's leadership on the world stage; meeting that goal requires sustained, strategic investment in the U.S. scientific enterprise that underpins our competitiveness and national security.

Now is the time for Congress to prioritize investments in federal scientific research and educational programs.

Federal investment in science is vital to compete with China

- China has pulled nearly even with the United States when it comes to total investment in research and development (R&D) and may take the lead this year if it hasn't already. China's annual rate of R&D growth is four times that of the United States.

- China is emerging as an innovation leader by rapidly expanding its global share of "triadic patents," i.e., patents that are filed in the United States, Japan, and the European Union for the same high-value inventions.



Source: Gross Domestic Expenditure on R&D (GERD), Constant U.S. dollars, PPP converted; OECD MSTI Database

- Chinese scientists are projected to erase the United States' lead in eight critical technology areas – including AI, semiconductors, materials, and high performance computing – in the next five years.

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AAU America's Leading Research Universities

Federal investment in science drives innovation

- Federal funding laid the foundation for modern AI through early research on neural networks, cognitive science, and computational techniques.
- Similarly, federal funding set the groundwork for modern autonomous vehicles through early research on computer vision, cyber-physical systems, and advanced algorithms and simulation.
- Through the NIH, federal funding drives biomedical innovation, resulting in novel and lifesaving drugs, therapeutics, and technologies such as the gene-editing tool CRISPR and mRNA vaccines.
- Every $10 million in NIH funding generates three additional private-sector biomedical patents.

Public investment in science drives economic growth

- R&D is a universal driver of productivity growth. The economy-wide, long-term returns are $5 for every $1 invested in R&D.
- The U.S. economy benefits immensely from public R&D. Federally funded research accounts for 25% of business sector productivity growth since WWII.
- In the 20th century, public R&D funding catalyzed advanced technology clusters - geographical concentrations of companies, universities, suppliers, and investors - in the United States, boosting technology entrepreneurship, manufacturing, and employment over subsequent decades.
- Federal agencies continue to be critical funders of research in such clusters today.

Through fellowships and research assistantships, federal funding supports 42% of new PhDs in critical technology areas like biotech, AI, and quantum.

Federal investment in science complements industrial science

- Public R&D funds novel, basic, long-term, non-commercial science: valuable to society in the long run, but less attractive to businesses that need greater certainty to recoup investment.
- In advanced economies, $1 of public R&D investment can yield $3 in follow-on private R&D investment.
- Federally funded academic science effectively stimulates startups. Startup activity is more than three times higher in areas with research institutions.
- Every $1.5 million in federal research yielding a successful startup worth more than $10 million.

Federal investment in science is a talent generator

- A significant portion of each federal research grant supports students and postdoctoral researchers, increasing the scientific output of young researchers over their careers and demonstrating a “ripple effect” of federally funded science teams.
- Federal agencies are the major source of support for new STEM PhDs in critical technology areas, supporting approximately 42% of all graduates through fellowships and research assistantships.

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