Trump's Science Policies Pose Long-Term Risk, Economists Warn

Since World War II, U.S. research funding has led to discoveries that fueled economic gains. Now cutbacks are seen as putting that legacy in jeopardy.

By Ben Casselman

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President Trump's tariffs could drive up prices. His efforts to reduce the federal work force could increase unemployment. But ask economists which of the administration's policies they are most concerned about and many point to cuts to federal support for scientific research.

The Trump administration in recent weeks has canceled or frozen billions of dollars in federal grants made to researchers through the National Institutes of Health, and has moved to sharply curtail funding for academic medical centers and other institutions. It has also, through the initiative called the Department of Government Efficiency, tried to fire hundreds of workers at the National Science Foundation, an independent federal agency. And it has revoked the visas of hundreds of foreign-born students.

To economists, the policies threaten to undermine U.S. competitiveness in emerging areas like artificial intelligence, and to leave Americans as a whole poorer, less healthy and less productive in the decades ahead.

“Universities are tremendously important engines of innovation,” said Sabrina Howell, a New York University professor who has studied the role of the federal government in supporting innovation. “This is really killing the goose that lays the golden egg.”

Scientists have warned that the United States risks losing its status as a leader in cutting-edge research and its reputation as a magnet for top scientific minds from around the world.

Already, labs across the country have begun laying off workers and canceling projects — in some cases stopping clinical trials that were already underway — and top universities including Harvard and the University of Pennsylvania have announced hiring freezes. France and other countries have begun recruiting American scientists, promising a more welcoming environment.

Economists across a broad ideological spectrum argue that investments in scientific research — especially the kind of fundamental, early-stage research that is too risky to attract private investors — are among the most efficient uses of taxpayer dollars. Research has found that every dollar invested in research and development returns about $5 in economic gains, a figure that likely understates the true return because it doesn’t account for benefits that aren’t captured in measures of gross domestic product, like longer lives and increased leisure time.

“It’s like a machine — you put a dollar in the machine and you get $5 back,” said Benjamin F. Jones, an economist at Northwestern University. “From a societal point of view, it’s an incredibly high-return activity that we already do too little of.”

Unexpected Discoveries

Hudson Freeze was an undergraduate at Indiana University in the 1960s when he began helping his professor, Thomas Brock, study microbes living in hot springs at Yellowstone National Park — work that was supported by a grant from the

National Science Foundation. He recalls the jolt of excitement the first time he looked through a microscope and saw one of those microbes, *Thermus aquaticus,* growing at a temperature previously thought impossible.

“I got goose bumps,” he said. “I was the first person in the world to see this under a microscope.”

Two decades later, that organism proved critical to the development of polymerase chain reaction, or P.C.R., a process of replicating DNA that is at the basis of virtually all genetic science. And Dr. Freeze went on to his own research career — also heavily supported by federal grants — studying a biological process that plays a role in dozens of rare genetic disorders.

Dr. Freeze’s work, both as an undergraduate and as a professional scientist, illustrates the unique role for government in scientific research. Few private investors would take an interest in disorders affecting just a handful of patients, much less in a project studying yellow slime growing in a national park. Yet that research has yielded tremendous dividends.

“Some of these things really pay off, some don’t — that’s science,” Dr. Freeze said. “The federal government has an ability to take a chance.”

The U.S. research and development system traces its roots to World War II, when the government poured money into universities and private companies as it scrambled to make advances in flight, communications and atomic weapons. Those relationships deepened in the following decades as the federal government funded projects tied to the Cold War and the space race, as well as research in basic sciences and medicine.

Researchers warn that the Trump administration's policies could allow U.S. science to fall behind. Lexey Swall for The New York Times

That research paved the way for many technologies that are central to the modern economy. The internet began as a network of university computers, funded by the Defense Department. Google began as a graduate student research project at Stanford, funded by a grant from the National Science Foundation. Virtually all of modern medicine relies, to some degree, on research that was supported by federal dollars. So does much of commercial agriculture.

Those discoveries, collectively, helped propel the United States' rapid economic growth and rising standard of living in the 20th century. A recent paper published by the Federal Reserve Bank of Dallas found that government investments in research and development accounted for at least a fifth of U.S. productivity growth since World War II.

"It has had a massive impact on people's standards of living," said Andrew Fieldhouse, an economist at Texas A&M University who was one of the study's authors. "It fueled economic growth to a sizable degree."

Fears for U.S. Leadership

Federal investments in science have fallen, as a share of the economy, since the end of the Cold War, and Dr. Fieldhouse's work suggests that is part of the reason that productivity growth, too, has slowed.

Researchers warn that the Trump administration's policies could allow U.S. science to fall behind. The National Institutes of Health, for example, have proposed capping the rate at which the government reimburses universities and other research institutions for "indirect costs," such as facilities and staff members not tied to a specific research project. In a working paper published Monday by the National Bureau of Economic Research, a group of economists found that the policy would lead to substantial funding cuts and would disproportionately affect institutions with the most successful research programs.

"We've had a pretty good run over the past 60 to 80 years," said Daniel P. Gross, a Duke University economist who was one of the study's authors. "Sometimes you don't realize the value of something until it's gone."

The concerns about losing ground in science are particularly acute in artificial intelligence, the technology that experts believe is most likely to drive productivity gains in coming decades. American companies have dominated the early phases of the A.I. revolution, partly because much of the foundational work was done at U.S. universities.

But the release this year of DeepSeek, an advanced A.I. model developed by a Chinese company, was seen by some American technology leaders as a new "Sputnik moment" — a sign that the United States needs to redouble its efforts to avoid falling behind.

White House officials reject the notion that the administration's policies are undermining U.S. leadership in science and technology. Vice President JD Vance, in a speech in Paris in February, called for easing restrictions on A.I. development, among other steps, to ensure that the United States remains ahead of China and other rivals.

A White House official, speaking on background, said the administration's moves to freeze grants and cut reimbursement rates reflect an effort to make federal investments in research more efficient, not to reduce support for the sciences overall.

Room for Improvement

Experts say there is ample room to reform the federal grant-making system. Application times for federal funding have gotten progressively longer over the years, and researchers dedicate an increasing share of their time to paperwork meant to ensure that government funds aren't wasted.

"When I heard the initial idea of DOGE, I thought, well maybe there's finally some momentum or impetus behind doing something here," said Stuart Buck, director of the Good Science Project, a nonprofit organization and newsletter that has been critical of the federal research and development system.

So far, though, Dr. Buck has been disappointed. By focusing on purported waste, he said, and canceling projects seen as out of step with the administration's political priorities — such as research related to race and gender or climate change — DOGE and other Trump administration efforts could make researchers even more risk-averse.

"It's just puzzling to me that so many of these efforts seem to be geared toward being paranoid about any fraud or any potential wasteful activity," Dr. Buck said. "There's so many examples where a study that looked frivolous at one point in time ended up leading to a breakthrough later on."

Scientists have similar concerns about some of the administration's recent moves on immigration, including revoking the visas of students involved in political protests.

Immigrants have long played a disproportionate role in scientific and technological advancement in the United States. A 2022 study found that immigrants have accounted for 36 percent of total innovation in the country since 1990, as measured

through patents, despite making up less than 20 percent of the population. They are also more likely to start companies and to work at start-ups than native-born Americans.

“Immigrants are really critical, they punch above their weight,” said Britta Glennon, a University of Pennsylvania economist who has studied the role of immigrants in innovation.

Even without formal shifts in immigration policy, she added, the United States could become less attractive to global talent if foreign students and scientists no longer see the country as welcoming. A recent working paper by Dr. Glennon and three co-authors found that Chinese students became less likely to study in the United States during the first Trump administration, even before it established formal restrictions.

“We know that international students are responsive to how they perceive the labor market to be in the U.S. and how receptive it’ll be for immigrants,” she said. “It’s pretty clear that it is not super receptive right now, so that is going to have effects.”

Ben Casselman is the chief economics correspondent for The Times. He has reported on the economy for nearly 20 years. More about Ben Casselman