

Analysis: As Congress Considers COMPETES, How Short Are We From The Old COMPETES?

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BOTTOM LINE: As of FY 2021, funding for key research agencies is:

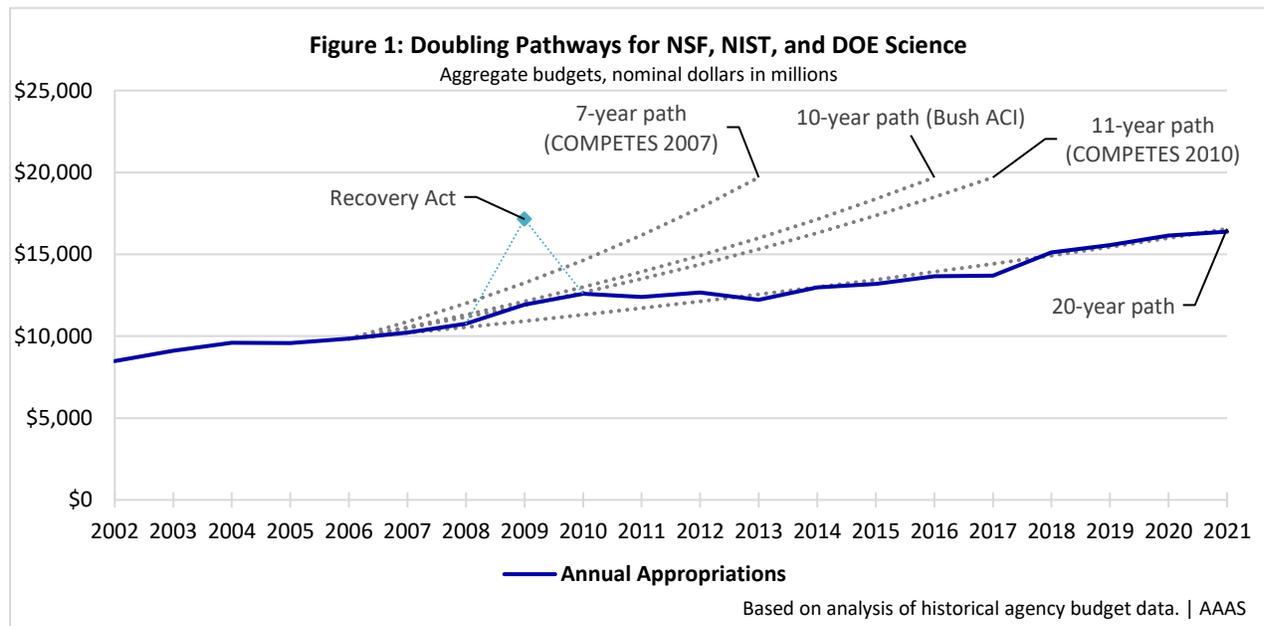
- At least \$6.7 billion annually, and \$77 billion cumulatively, below COMPETES 2007
- At least \$4.9 billion annually, and \$44 billion cumulatively, below COMPETES 2010
- \$5.2 billion annually, and \$29 billion cumulatively, below historical trends due to the Budget Control Act caps

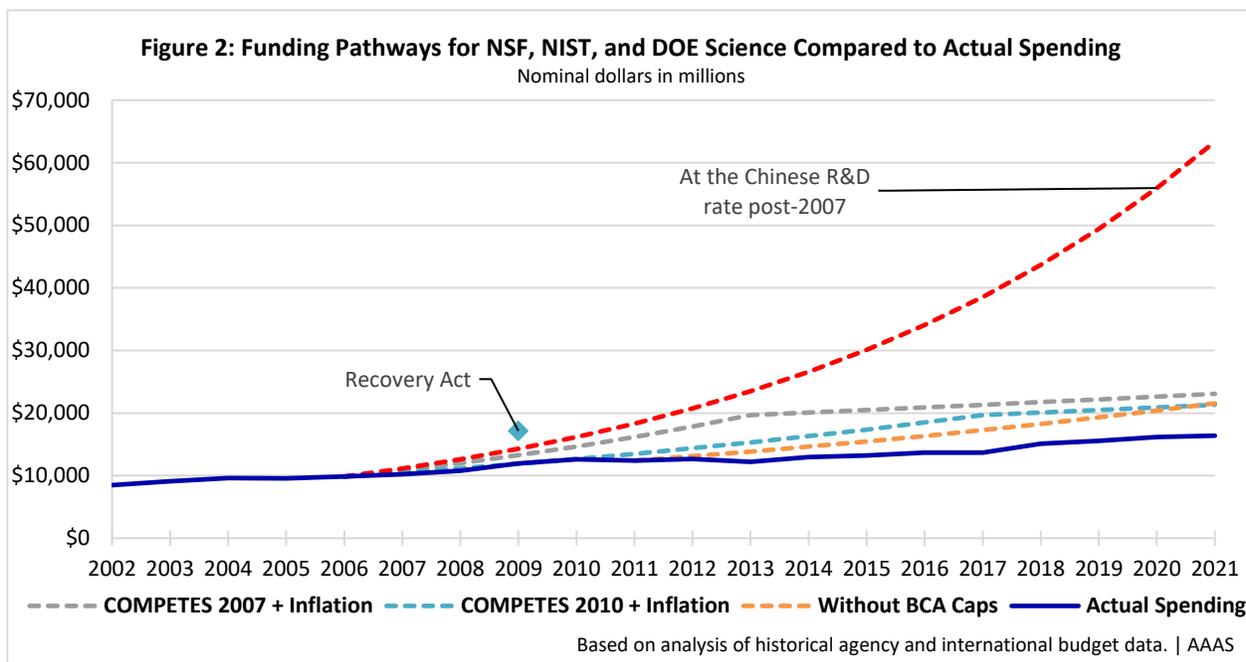
Congress is considering major increases for research agencies including the National Science Foundation (NSF), the Department of Energy Office of Science (DOE Science), and the National Institute of Standards and Technology (NIST). The legislation currently under consideration would establish aggressive funding targets: for instance, the House DOE Science bill authorizes a roughly seven-year doubling path, while the House and Senate bills would both authorize a doubling for NSF over a few years.

But this is not the first time Congress has attempted such targets for these agencies. In

2007 and 2010, amid similar concerns over U.S. science and innovation, Congress also adopted versions of America COMPETES. These would have achieved similar ends as the current legislation, but actual appropriations ended up far short of their intended targets. This brief analysis quantifies the shortfall from the earlier COMPETES, as well as two other illustrative benchmarks Congress may also wish to consider as context.

America COMPETES Background. In 2005, U.S. competitiveness was placed squarely in the spotlight. That year, in response to bipartisan requests from leadership of the energy and science committees, the National Academies released their *Rising Above the Gathering Storm*¹ report which called for a seven-year budget doubling for NSF, DOE Science, and NIST labs and construction from FY 2006 levels. The following February, President George W. Bush also made competitiveness a central theme of his State of the Union, establishing an American Competitiveness Initiative and pledging to double





the physical science research budget in ten (rather than seven) years.²

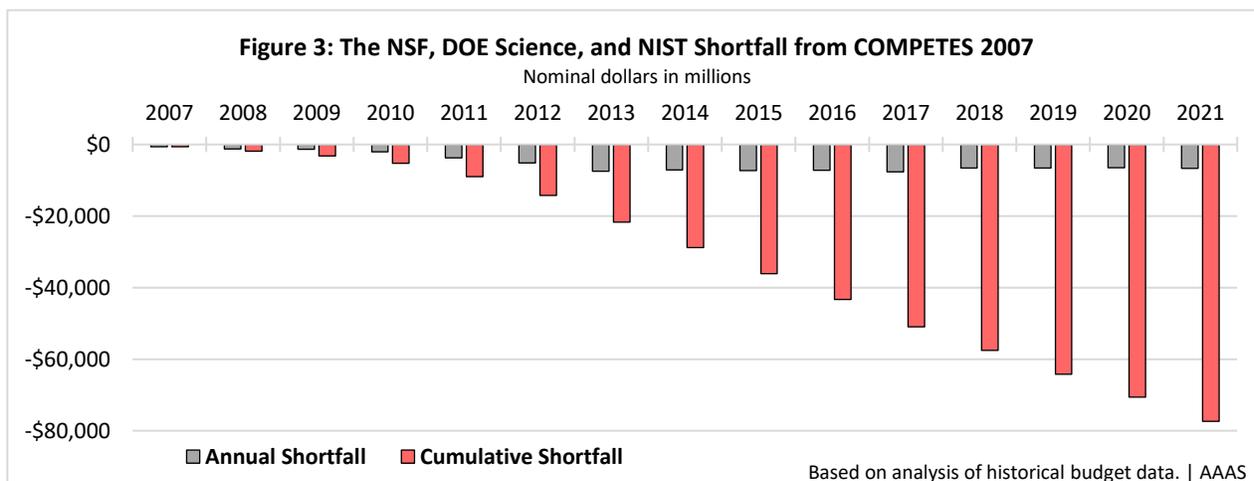
Congress ultimately opted for the seven-year path in the 2007 America COMPETES, adopted with overwhelming bipartisan support. But, as seen in Figure 1 on the previous page, annual appropriations failed to meet these targets. Congress then opted for a slower 11-year doubling when it revisited COMPETES in 2010.

The Shortfall Below COMPETES. To calculate the ongoing shortfall below the 2007 and 2010 acts, we can start with alternate scenarios in which Congress doubled the agencies as authorized, and provided inflationary increases thereafter. This is quite conservative, as federal R&D

programs have historically grown closer to 6% per year on average.

These COMPETES-and-inflation scenarios are shown in Figure 2. In addition, the annual and cumulative shortfall of actual appropriations below the COMPETES 2007 path are shown in Figure 3, and a table with all figures is shown at the end. Under these scenarios:

- As of FY 2021, NSF, DOE Science, and NIST are a combined \$6.7 billion below where they might have been in FY 2021 appropriations under the COMPETES 2007 path, with a cumulative shortfall of \$77 billion since FY 2006 (Figure 3).
- Shifting to COMPETES 2010, these agencies are now \$4.9 billion below where they might have



been in FY 2021 appropriations, with a cumulative shortfall of \$44 billion since FY 2010.

- If we assume that once Congress completed the COMPETES 2007 or 2010 doubling, it would have funded these agencies at the historical R&D growth rate of 5.7% instead of simply at the rate of inflation, then the shortfall is even larger: the current shortfall is over \$14 billion below COMPETES 2007 and over \$8 billion below COMPETES 2010, with cumulative shortfalls of \$109 billion and \$52 billion, respectively.

As can be seen in Figure 1, agency appropriations are actually on a rough 20-year doubling path from FY 2006, only slightly ahead of inflation and well below the more ambitious pathways.

Other Benchmarks. Two other benchmarks are shown in Figure 2 for additional perspective.

First, there's the restrained growth due to the Budget Control Act spending caps, which were

put in place beginning in FY 2012. What might have happened to the NSF, DOE Science, and NIST budgets had Congress simply funded them at historically consistent rates, rather than implementing the caps? As mentioned previously, federal R&D budget authority grew 5.7% per year over the 30 years leading up to the financial crisis. If agencies had simply been funded at this rate, their aggregate budgets would be \$5.2 billion higher in annual appropriations today. This works out to a \$29 billion cumulative shortfall over the past decade.

Second, the U.S. continues to contend with the meteoric rise of China. Since the original COMPETES Act, Chinese R&D spending has grown by 13% per year. If funding for these agencies had somehow matched that staggering pace, their budgets would be \$47 billion higher today (see table).

Projected Shortfalls of NSF, DOE Science, and NIST Funding Below Various Pathways																
Nominal dollars in billions																
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Cumulative
COMPETES 2007	-\$1	-\$1	-\$1	-\$2	-\$4	-\$5	-\$7	-\$7	-\$7	-\$7	-\$8	-\$7	-\$7	-\$6	-\$7	-\$77
COMPETES 2010				\$0	-\$1	-\$2	-\$3	-\$3	-\$4	-\$5	-\$6	-\$5	-\$5	-\$5	-\$5	-\$44
Without BCA Caps						\$0	-\$2	-\$2	-\$2	-\$3	-\$4	-\$3	-\$4	-\$4	-\$5	-\$29
China's Rate of Investment	-\$1	-\$2	-\$2	-\$4	-\$6	-\$8	-\$11	-\$14	-\$17	-\$20	-\$25	-\$29	-\$34	-\$40	-\$47	-\$259

¹ <https://www.nap.edu/catalog/11463/rising-above-the-gathering-storm-energizing-and-employing-america-for>

² <https://georgewbush-whitehouse.archives.gov/stateoftheunion/2006/>