Easing the Squeeze on R&D

A strong economy and broad support in Congress augur well for R&D to do even better in next year's budget battles than it did this year. But any new round of spending is sure to trigger stiff competition

Researchers dependent on federal support may find that what happens next year on Wall Street could be just as important as what happens in Congress. That's because the booming U.S. economy generates larger than expected revenues for the Treasury Department, shrinking the budget deficit and reducing pressure to cut government spending. There are already signs that the era of stagnant budgets may be over: When Congress adjourned last week, it had increased R&D spending for 1998 by 4%—twice the amount requested by the White House (see table). What's more, a growing number of politicians are talking about how R&D spending could rise significantly next year if the deficit disappears as early as 1998 rather than in 2002, as projected in this summer's budget agreement.

That sunny prospect has some legislators bracing for a free-for-all over how to spend the additional revenues. "It will be the mother of all budget battles," predicts Representative James Sensenbrenner (R–WI), a fiscal conservative who also chairs the House Science Committee. While Sensenbrenner maintains that researchers are in a good position to reap some of the potential benefits, others caution against raising expectations as the Administration prepares its 1999 spending plan. "We can't get so enthusiastic that we start deficit spending again," warns Jack Gibbons, the president's science adviser.

Even without a surplus, however, there is agreement that pressure to make extensive cuts in discretionary funding—the part of the budget that includes all federal R&D—will be less intense than in past years. When President Clinton took office in 1993, for example, a $255 billion deficit was projected to keep growing, reaching $360 billion next year on its way to $400 billion (see graph on p. 1392). Given the seemingly inexorable rise in entitlements like Medicare, which are politically hard to rein in, and the soaring interest on the debt, discretionary spending was targeted for big cuts. But several years of economic growth have boosted tax revenues and nearly erased the deficit. "It's clear the budget situation has improved much more than we expected, and it's possible the budget will be in balance in the next year or two," says Representative George Brown (D–CA), ranking minority member of the science panel. "That would ease the squeeze."

A RISING TIDE FOR MOST R&D BOATS

Agency	1997 Budget	1998 Request	1998 Final	% change
National Institutes of Health	$12.7 billion	$13.1 billion	$13.6 billion	+7.1%
NSF Research	$2.4 billion	$2.5 billion	$2.6 billion	+4.7%
NSF Education	$619 million	$625 million	$632 million	+2.2%
NASA R&D	$9.3 billion	$9.6 billion	$9.8 billion	+5.3%
Department of Energy R&D	$6.1 billion	$7.0 billion	$6.3 billion	+3.1
Department of Defense R&D	$36.6 billion	$36.9 billion	$37.9 billion	+3.5%
Agriculture R&D	$1.54 billion	$1.48 billion	$1.55 billion	+0.6%
Interior R&D	$581 million	$608 million	$616 million	+6.1%
Transportation R&D	$650 million	$684 million	$636 million	–2.1%
Environmental Protection Agency R&D	$541 million	$579 million	$618 million	+14.2%
Commerce Dept. R&D	$983 million	$1.1 billion	$1.1 billion	+10.6%
TOTAL R&D*	**$73.3 billion**	**$74.8 billion**	**$76 billion**	**+3.7%**

* Includes R&D from other agencies.

SOURCE: AAAS

Unrealistic request

The first salvo in next year's budget wars—the president's submission to Congress in February of his proposed 1999 budget—isn't likely to paint a dramatically more favorable picture for science's future. That's because the White House Office of Management and Budget (OMB) must abide by the stringent limits spelled out in last summer's budget agreement between Republican leaders in Congress and the White House. But most analysts agree that pact no longer reflects economic reality. "The chances are good that the 1999 request will be ignored," laments one frustrated White House budget analyst. Nevertheless, the president's request will be the starting point for next year's congressional deliberations, and the current battles between OMB and individual agencies are fierce.

NASA, for example, almost certainly will be forced to request a significantly smaller budget than it has this year (see sidebar). The Energy Department, meanwhile, is hoping for a windfall in energy R&D given the White House's current focus on reducing greenhouse gases. The National Science Foundation (NSF) expects at least a small increase over its 1998 level of $3.4 billion, Administration sources say. The impetus is likely to come from initiatives the foundation will be starting in 1998, such as knowledge and distributed intelligence, life in Earth environments, and integrating research and education in graduate training. However, NSF and White House officials still have not resolved how much of the remaining $50 million needed to rebuild the South Pole station to ask for in 1999, for example, or how to repackage a proposed $25 million Polar Cap Observatory to be built in northwest Canada in a way that would mollify Senator Ted Stevens (R–AK), who held up the project this year in hopes of winning a similar facility for his state.

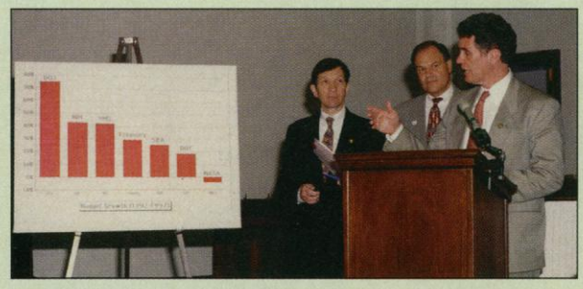
In spite of these disagreements, Congress provided a bigger boost for NSF's 1998 budget than the president requested, and researchers hope it will do the same next year if the 1999 request contains only a modest increase. "Generally, when the money is there, NSF does well," NSF director Neal Lane told the National Science Board, the agency's governing body, at its November meeting.

One agency that has long depended upon the continuing kindness of Congress is the National Institutes of Health (NIH), which unlike other R&D agencies routinely ends up with more money than the White

NASA Faces Billion-Dollar Problem

Prospects for much of the federal government's research enterprise may be looking up (see main text). But NASA's budget trajectory is still headed down. The agency's annual budget has fallen by $1 billion, to $13.6 billion, in the past 4 years, and it has taken an aggressive cost-cutting campaign by NASA chief Daniel Goldin to stave off the cancellation of major programs. And right now, next year looks even worse.

The problem is exacerbated by the fact that the international space station is as much as $1.5 billion over budget, according to Administration officials. That's nearly twice as much as NASA officially acknowledges, and the overrun is forcing NASA managers to reexamine other programs to find an additional $200 million in 1998 to keep the space station on track. However, its options are limited: Congress has forbidden NASA from tapping its science account to pay for the 1998 share of those overruns, and the agency has already put the squeeze on its space shuttle program. Meanwhile, the White House Office of Management and Budget last month quietly proposed chopping NASA's 1999 budget request by another $1 billion. If that were to happen, agency supporters say it would be virtually impossible to meet station overruns and maintain a vibrant science effort.



HOUSE PHOTOGRAPHY OFFICE

Spaceship Down. Weldon, far right, and legislative friends seek to reverse NASA's budget woes.

That dire prospect has spurred a group of lawmakers, led by Representative Dave Weldon (R–FL), to write House Speaker Newt Gingrich (R–GA) demanding that Congress reverse this decline next year. The 1 November letter, signed by more than 190 House members, warns that further cuts "could inflict irreparable harm on the agency's missions and personnel." Instead, the legislators want NASA's budget to rise by 4%, after inflation. Representative Jerry Lewis (R–CA), who chairs the panel that funds NASA, says he shares their concerns. "I have a call in to the vice president to discuss NASA," he adds.

"There is a major fight going on right now" over the proposed 1999 cuts to the agency, acknowledges one White House official. But Jack Gibbons, the president's science adviser, plays down any disagreement. He notes NASA's success in cutting costs, although he acknowledges that "space station work has run into a little snag." He says the congressional letter is "a good sign of concern about getting NASA to a stabilized condition rather than massive budget decline." But he adds that it's not clear "where we will get the dollars to do this."

In the meantime, there is at least an appearance of crisis. Wilbur Trafton, NASA's space station program chief, quit last week for personal reasons, while Alabama lawmakers are up in arms over recent rumors that the Marshall Space Flight Center in Huntsville could be closed. But Administration officials insist there are no plans to shutter Marshall, and they say that the budget problem can be managed. A White House source says the agency's 1999 request is almost certain to be above $12.6 billion. "NASA will get more," the official says.

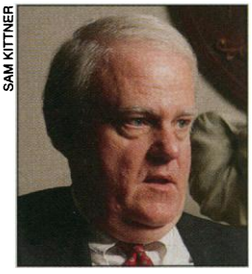
Any drop in the request from current levels, however, will make it harder for legislators to argue their case for shoring up the NASA budget next year. "We don't have the cachet of health research," one agency official complains. "We're not making medical breakthroughs yet on the space station." But NASA supporters like Lewis say they are prepared to fight to save both space science and the space station. "I have a new, 360-degree photo of Mars on my wall" taken during last summer's Pathfinder mission, says Lewis. "It's an inspiration. We must find the ways and means to fund these programs." **–A.L.**

House requests. And next year could be a real bonanza. One Washington observer says the Department of Health and Human Services is urging the White House to ask for a 10% increase for NIH. NIH director Harold Varmus declined comment on this figure, but says he is aware that many people are talking about giving NIH more than even the most optimistic planners envisioned a year ago.

Representative John Porter (R–IL), who chairs the House appropriations subcommittee that handles NIH's budget, has endorsed what until recently seemed an impossible goal—doubling NIH's $13.6 billion budget in just 5 years. Talking about the subject "puts me on delicate ground," Varmus notes, because he works for the president and "obviously, we advocate for the president's budget." And the budget agreement leaves little room for such a large increase, say other Administration officials.

"We can't get so enthusiastic that we start deficit spending again."

—Jack Gibbons



SAM KITTNER

"It will be the mother of all budget battles."

—James Sensenbrenner

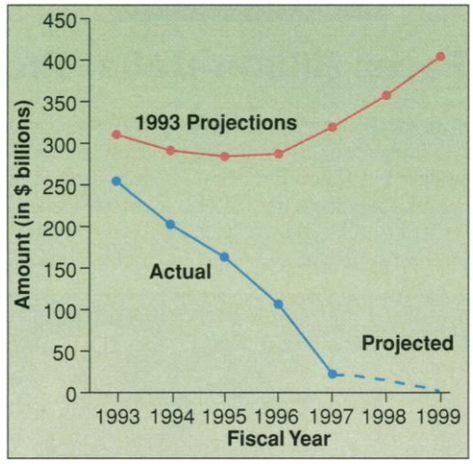
But Varmus plans to be ready if political opportunity knocks. "We're not deaf," he says. "We're doing some active thinking about what would happen" if Congress really did double NIH's budget. "We could spend it very usefully." Winners might include mouse genome studies, developmental biology, new human genome projects, diabetes and Parkinson's disease research, and a National Cancer Institute program called the Cancer Genome Anatomy Project—an ambitious scheme to identify all the genes that are differentially turned on in tumor cells (*Science*, 16 May, p. 1023). He adds, however, that even if the budget grows significantly, "we are not trying to increase the number of investigators. ... We have to think of ways we can make our scientists more productive, not just more numerous."

Sharing the surplus

Congressional generosity toward R&D depends in large part on whether the economy continues to boom, thereby boosting federal revenues, as well as on the ability of science advocates to make their case. Any surplus arising from a balanced budget is sure to set loose what Brown calls "powerful forces" eager to get a share of the expanding pie. Some Republicans will want tax cuts, some Democrats will back increases for social spending, and legislators from both parties will be eager to fund road and bridge projects in their districts and states.

Sensenbrenner is upbeat about the outcome of such a fight for science and technology, noting that "research is in a good position because we've taken the politics out of it." He notes that House Speaker Newt Gingrich (R–GA) has called for investing some of a potential surplus in R&D—as has Democrat Brown—and that senators from both parties have signed onto a bill introduced by Senator Phil Gramm (R–TX) to double civilian R&D spending over 10 years.

Other R&D advocates, while happy with the turn of events, are more cautious. "I don't want to depend on optimistic projections into the next century," says Representative Jerry Lewis (R–CA), who chairs the House appropriations panel that oversees the budgets for NASA and NSF. "We have to do more with less, and I see the overall budget shrinking, not growing." Adds Brown, "I'm not so optimistic about improving the role of R&D. It will be a tough struggle for dollars." Gibbons holds an even more skeptical view: "If Congress finds a new pot of gold, I would be delighted. But I'd like to know where it will come from."



SOURCE: CONGRESSIONAL BUDGET OFFICE

Falling down. A booming economy has invalidated earlier projections of an ever-expanding budget deficit.

Of course, not all agencies will share equally in any congressional pot of gold. For example, while praising Congress for its support of research, Lane cautions legislators against favoring some R&D agencies at the expense of others. In particular, he notes how the growth in NIH's budget has far outpaced the rate for other agencies. "If that trend continues," he told members of the science board last week, "there are some serious questions that could be raised about the proper balance among R&D agencies."

Despite such rumblings, lawmakers agree that one key to success will be the community's continued ability to maintain a united front. "There's no question the community did a very good job in the past 18 months—we stopped the pattern of one group fighting with the other over priorities," says Lewis. Adds Brown, a longtime friendly critic of researchers: "The science community has been more active and better organized in making the case for R&D in general." And he warns, "you can't rest on your laurels."

–Andrew Lawler

With reporting by Eliot Marshall and Jeffrey Mervis.

DATABASES

RaDiUS Draws a Bead on U.S. R&D

In the early 1990s, when the U.S. government decided to team up with the auto industry to build a "greener" car, it promised carmakers full access to relevant research at its vast network of national labs. But Rob Chapman, a former vice president of Allied Signal who joined the Commerce Department in 1993 to chair its technical task force on the Partnership for the Next Generation Vehicle, soon discovered that it was an empty promise. "Industry started with a simple question: What have you got that can help us?" he recalls. "But nobody had any good answers."

The problem, Chapman discovered, was the lack of a central repository of information on how the government spends its $70 billion a year R&D budget—who it was funding, and what they were doing. Fortunately for Chapman, the consortium was able to tap into a fledgling database called RaDiUS (Research and Development in the United States) developed by The RAND Corp. Today, that database has grown to cover 24 federal agencies, with information on more than 1500 programs and nearly 300,000 separate grants and contracts. And now it's available, at a price, to almost anyone in the scientific community.*

RaDiUS was developed for the Critical Technologies Institute (CTI), a small, federally funded think tank set up by Congress in 1991 that RAND manages. When the Clinton Administration created the National Science and Technology Council to oversee federal R&D, it asked CTI to help R&D managers find out quickly what their colleagues in other agencies were funding. The idea was to eliminate duplication, foster collaborations, and highlight gaps. Rather than work on the problem piecemeal, RAND officials decided to look at the big picture. The result was RaDiUS.

The database offers both a broad overview of R&D, using a range of categories that includes subject, year, geographic location, R&D performer, budget category, and funding mechanism, as well as detailed information on the work being performed both within and outside federal labs. Of course, the database is only as good as the data provided by federal agencies. And the quality varies widely. "Some agencies are very good at keeping track of and describing what they fund, while others have difficulty getting down to the level of individual awards," says RAND's Donna Fossum, who developed and manages the database. "But we're working with them."

As with any search, the choice of terms makes a big difference. A query about biodiversity, for example, yields a relatively small harvest given its prominence—11 agencies and 450 awards. But CTI staff members explain that such a term is so broad that it may not be mentioned in a description of programs related to the topic. A query about fuel cells or autism, they say, is more likely to ferret out the desired information.

It's too early to see the impact of RaDiUS on overall federal R&D spending patterns, says Fossum. But she says it has added another weapon to the arsenal of R&D managers looking to get the most for their money. "The federal government needs something like this," says Fenton Carey, who coordinates research and technology for the Department of Transportation. "It's a tool to make more informed decisions."

RaDiUS has been available to federal managers for the past 2 years. Now any institution with a federal contract can buy a license to use it for $7000 a year. "And I don't think there are too many universities or nonprofit organizations that don't have at least one federal contract," says Fossum.

–Jeffrey Mervis

* For more information, contact CTI at 202-842-5922, or check out a free demo on the Web, at www.rand.org/radius