News and Comment

Budget: Total Funds for R&D Rise Modestly to 15.4 Billion; Research Gets Most of Increase

One way to put the President's budget for the 1966 fiscal year in perspective is to keep firmly in mind that it is designed for an economy which has been expanding steadily for nearly 4 years, thereby setting a postwar record.

The Gross National Product (GNP), which represents the total of goods and services produced in the U.S. in a given year, has risen from $509 billion in fiscal 1961 to an estimated $640 billion in the current fiscal year. It is expected to go up in fiscal 1966 to $660 billion. The rate of growth has climbed from a sluggish 2 percent in fiscal 1961 to over 5 percent in the current year—surprisingly without serious inflation.

This period of prosperity has been marred, however, by substantial unemployment, usually ascribed to rising productivity in a period when the number of employables is rising rapidly. Until this year the national rate of unemployment had stuck above 5.5 percent, but last summer it went below 5 percent in the solidest improvement in 7 years.

President Johnson's fiscal 1966 budget is no economic boat rocker, but it affirms the quiet revolution in budgetary policy worked in the Kennedy-Johnson years. A main feature of the new policy has been an implicit decision to plan budget deficits so long as unemployment remains severe. An unemployment rate of 4 percent—not full employment, but a rate viewed as "acceptable"—was established as a goal by Kennedy and tacitly recognized by Johnson.

In 1963 Kennedy put his cards on the table, so to speak, when he asked for a major tax cut which would enlarge an expected deficit for fiscal 1964. The tax cut, designed to stimulate consumer spending and business investment, was to go into effect while federal expenditures were maintained at a high level. The object was to spur the revived but still limping economy and thereby reduce unemployment.

The tactic flew in the face of custom and conventional wisdom (and also congressional opinion) which call for movement toward a balanced budget when a recession slackens. A tax-cut bill bogged down late in the year of Kennedy's assassination, but one passed early last year after the new President put a top priority on it and heavy pressure behind it.

This year Johnson has asked for an administrative budget (exclusive of social security and other trust funds) of about $99.7 billion, compared with $97.5 billion last year. Despite the increase, the budgeted deficit for 1966 is about $5.3 billion, smaller—because of increased revenues—by $1 billion than the estimated deficit this year.

Like Kennedy, Johnson continues to pay homage to the balanced budget as the fiscal beau ideal. But it seems evident that he puts economic growth first. In a key reference in his budget message on Monday, Johnson said, "This budget recognizes that a growing economy is needed to promote national strength and progress. It is also needed to move us toward a balanced budget. When the economy slows down, Federal revenues fall and spending tends to increase. The result is larger not smaller deficits."

The rapid rise in revenues in recent months creates prospects for a balanced budget in the future, but there have been hints that this has caused mixed feelings within the administration.

In a briefing on the budget, Treasury Secretary Douglas Dillon and Budget Bureau Director Kermit Gordon last Saturday agreed that a balanced budget was a possibility for fiscal 1967 or '68, but they seemed cautious about predicting that it would be achieved or, in fact, energetically sought. Gordon said that prospects for a balanced budget "depend greatly on our capacity to sustain a steady advance in the economy."

It seems, however, that smaller deficits may be in store. The question of inflationary pressures seems to be relevant again. An unemployment rate of 4 percent remains an unachieved goal, but, as Dillon noted, "we are nearer full use of human and financial resources than at any time in the recent past." The rise in steel prices and recent signs of greater aggressiveness on the part of labor in contract negotiations may signal the end of a long period of stability in prices and wages. At any rate, Dillon observed, it would be necessary to "apply stimuli more carefully in the future."

It is said that Johnson reveres the memory of Franklin Roosevelt, and it can be argued that the Johnson budget is a kind of memorial to New Deal economics, of which J. M. Keynes was the prophet. What is particularly noteworthy is the fact that the business community, or at any rate the big business community, has tacitly accepted the new style.

How Much Influence

It remains impossible to gauge to what extent the federal monetary and fiscal policies of recent years have been responsible for the expansion of the last 4 years. It is equally difficult to say how much the increase in federal support of research and development activities—the federal R&D budget rose from $9.2 billion in fiscal 1961 to $15.3 billion in the current fiscal year—contributed to the boom.

The new budget calls for another increase in the federal R&D budget, but the rise would be the smallest in a decade. Trends discernible when the 1965 budget appeared last year (*Science*, 24 January 1964) continue, with leveling off in the total R&D budget governed by the requests for its two largest components, defense and space. Funds for development programs for the Department of Defense are scheduled to decline this year (about $4.9 billion would be spent, compared with some $5.4 last year). NASA's R&D budget would rise, but not so sharply as in recent years (R&D funds for NASA would increase from $3.15 billion in fiscal '65 to $3.4 billion this year, and the total agency budget would rise from expenditures of $4.9 billion to $5.1 billion).

The special analysis of federal research, development, and related pro-

Table 1. Obligations for conduct of development (in millions of dollars).

Department or agency	1964	1965	1966
Defense	5489	5136	4972
NASA	3210	3768	3878
AEC	933	939	929
Other	147	137	217
Total	9779	9980	9996

Table 2. Obligations for conduct of research (in millions of dollars).

Department or agency	1964	1965	1966
Defense	1769	1860	2114
NASA	1109	1333	1301
AEC	303	330	363
HEW	759	858	961
NSF	170	212	290
Other	353	430	468
Total	4463	5023	5497

grams in the 1966 edition of *The Budget of the United States Government* (which is fairly detailed but the most digestible of the budget documents) goes to greater lengths this year than ever before in separating funds for research from those for development. A breakdown for the two categories is shown in Tables 1 and 2, with requests for "new obligational authority" indicated—that is, funds that would be obligated but not necessarily spent in the fiscal year shown.

Of the $5.49 billion to be obligated for research, some $2.27 billion is earmarked for basic research, most of it to be performed in academic institutions (see Table 3).

The most conspicuous increase requested in the R&D budget would fall to the National Science Foundation, with new obligational authority scheduled to rise from a total of $420 million in '65 to $530 million in fiscal '66. (Expenditures would run at a considerably lower level—$325 million for this year, $405 million for next.)

In the detailed budget appendix it is noted that "major emphasis in 1966 is on providing funds in the Foundation budget to maintain an adequate rate of growth in Federal support for research in colleges and universities. Funds are also included for increased support for graduate training in the sciences and engineering and strengthening science programs at developing institutions."

The budget requests, if Congress provides the funds, would effect a 51-percent increase in basic research project grants ($120.7 million this year, $191 million in fiscal 1966) and a 27-percent increase in institutional science grants ($75 million in obligational authority this year, $95 million in '66).

Among relatively small programs, the most dramatic boost in funds would go to the Office of Saline Water in the Department of the Interior. Authority to obligate $26.5 million in '66, compared with $10 million in fiscal '65, is asked for the agency. Some $20.4 million of this bigger budget would be in contracts and grants for nonfederal research and development. The total budget for water research and surveys this year for all agencies will rise from the current $75 million to $101 million for the coming year as a result of new water-resources legislation and the President's interest in water problems, particularly desalination.

In special categories of research (such as oceanography and the atmospheric sciences), which have received heavy emphasis in other years, there are no striking developments. Funds for oceanography would increase to $141 million for '66, compared with $135 million for the current year—a modest rise hardly resembling the budgetary leaps and bounds called for earlier by some planners. Funds for research in the atmospheric sciences would rise from the $194 million to be obligated this year to $219.5 million in fiscal 1966. The 1966 figure, however, falls short of the $225 million of the fiscal-1964 budget. Fluctuations in these funds seem to be explained chiefly by annual ups and downs in costs of satellite development and by the frequency of flights, which, of course, are costly.

On the Plateau

In perspective, then, the budget reflects a slowing of growth in combined R&D funds among the agencies which are the giants in the field—Defense, NASA, the AEC. Health research continues to rise at a somewhat faster rate. An estimated $1.3 billion would be spent in '66 for health research—up about $160 million over last year, a large part of the increase being contained in the increment to the National Institutes of Health research budget, which would go to $742 million from $650 million in the current year.

According to Donald F. Hornig, presidential science adviser and director of the Office of Science and Technology, the research component in the total R&D budget would rise about 10 percent in 1966 as development funds slack off. The total for federal funds directed into research performed in academic institutions is slated to rise some 15 percent, says Hornig.

Table 3. Obligations for conduct of basic research (in millions of dollars).

Department or agency	1964	1965	1966
Defense	260	293	324
NASA	756	910	888
AEC	238	260	286
HEW	265	298	330
NSF	170	212	290
Other	119	145	154
Total	1808	2118	2272

While troubles abroad or in the economy at home could alter the situation, it appears that both the national budget and its R&D component are in a period of slower growth. Stability in spending for defense and space account for this situation, and so long as the GNP rises at a satisfactory rate the administration will probably seek to "invest" in education and poverty programs.

But on the horizon, or perhaps a little beyond it, lie crucial decisions on a missile-defense system. While the President did not mention the Nike-X antimissile missile system by name in his defense message last week, he alluded to it indirectly when he said, "Decisions with respect to further limitations of damage [from thermonuclear attack] require complex calculations concerning the effectiveness of many interrelated elements. Any comprehensive program would involve the expenditure of tens of billions of dollars. We must not shrink from any expense that is justified by its effectiveness, but we must not hastily expend vast sums on massive programs that do not meet the test."

Involved is not only a cost-effectiveness estimate for an antimissile defense program and its corollary, a very big civil-defense shelter program, but also an assessment of the implications of such programs for our relations with other nations, particularly with the Soviet Union.

Undertaking a missile-defense program would require a massive diversion of resources, both material and human, and would obviously deeply affect the federal R&D effort. The new budget hardly hints it, but President Johnson seems sure to be confronted, in the next few years, with what may be the most complex and serious political-technical question any President has ever had to face.—JOHN WALSH