More Jobs and Economic Growth Seen in R & D Spending

Addressing a AAAS colloquium on R & D budgeting 16 June, Representative Brock Adams (D–Wash.), chairman of the new House Budget Committee, told his listeners something they were delighted to hear. He suggested that Congress should scrutinize money requests for research and development with greater care and solicitude "because such R & D may benefit the nation's economy more than was previously imagined."

Adams said that two recent studies sponsored by the National Aeronautics and Space Administration "suggest that federal R & D investment may have a highly leveraged effect on the economy—that is, you can get a relatively large return on a small investment." Referring to a study prepared by Chase Econometric Associates, Inc., of Bala Cynwyd, Pennsylvania, he noted that every dollar invested in research and development had been found to yield a return of $14 to the gross national product over a 10-year period. "This means increased employment and productivity," he observed.

Actually, the point Adams was making has often been made before, though perhaps not by anyone holding so prominent a position in the budget-making process as his. In 1967, for instance, the Technical Advisory Board of the U.S. Chamber of Commerce reported that the rate at which new jobs are created and sales are expanded is substantially greater for innovative high technology companies than for companies using "more mature" technologies. This was of course recognized at the time as a good argument for the federal government to continue to support research and development generously.

Nevertheless, as a result of such factors as inflation, the winding down of the Apollo program, the voracious fiscal demands of the Vietnam war, and growing doubts among some people that science and technology really benefit society, government support for R & D (measured in constant dollars) was to begin to decline by the early 1970's.

If the current congressional experiment in fiscal self-discipline works out as planned, Adams and his Senate counterpart, Edmund S. Muskie, chairman of the Senate Budget Committee, will rank with the appropriations committee chairmen in influence over budgetary priorities and ceilings. The House and Senate budget committees, which are backed up by a large professional staff, are authorized by the Congressional Budget Act of 1974 to oversee both revenues and expenditures. But 1976 is a critical year for the new budget-making process, because it marks the first time that the process has actually been applied.

In his talk to the AAAS symposium, Adams observed: "Research work has grown complex and remote. There is a general lack of understanding on the part of the public and the Congress of what research is and what it can produce." In view of this, he suggested that scientists try to explain to the public "what the broad relationships" are between research and present-day technology and possible technologies of tomorrow.

"It is so easy to make sport of the 'irrelevance' and 'uselessness' of research projects with strange and incomprehensible names," he said. "I urge you to devote more effort to giving the public greater understanding of what you are doing and why it is important."

Also, Adams recommended a "little public relations effort" to highlight the economic impact of R & D, and, in this connection, he mentioned the study by Chase Econometrics and one by Mathematica, Inc., of Princeton, New Jersey.

The abstract of the Chase study says that "the large beneficial economic effects of NASA R & D programs . . . stem from the growth in general productivity [that is induced]. Growth in productivity means that less labor (and/or capital) is needed per unit of output. This results in lower unit labor costs and hence lower prices. A slower rate of inflation leads in turn to a more rapid rise in real disposable income, which provides consumers with the additional purchasing power to buy the additional goods and services made possible by the expansion of the economy's production possibility frontier. Finally, the increase in real consumer expenditure leads to an increase in demand for the services of labor."

The Mathematica study examines NASA's contribution to the economic benefits derived from four selected technological advances. The most important of these was the development of integrated circuitry, the fastest growing segment of electronic component technology during the past 15 years. The conclusion in this case was that, by forcing the pace of integrated circuit development, NASA will have generated a total of about $5 billion (to cite an intermediate estimate) in benefits to the U.S. economy by 1982.

Adams noted, too, that the importance of R & D spending to economic prosperity is also emphasized in a new report issued by the Commerce Technical Advisory Board. This report was written by Richard S. Morse, president of the MIT Development Foundation and founder of one of the first "Route 128" high technology companies, and one of his associates, John O. Flender. It compares the growth in sales and new jobs achieved over the 1969–1974 period by five companies selected from each of three categories, which were labeled "mature" (Bethlehem Steel and DuPont, for example), "innovative" (such as Polaroid, IBM, and Texas Instruments), and "young high technology companies" (such as Data General and National Semiconductor).

The average annual rate of growth in sales was 42 percent for the young high technology companies, 13.2 percent for the innovative companies, and 11.4 percent for the mature companies. The annual rate of growth in jobs was 40.7 percent for the young high technology group, 4.3 percent for the innovative companies, and 0.6 percent for the mature companies.

During the 5-year period, the six mature companies (with combined sales of $36 billion in 1974) showed a net gain of only 25,000 jobs, whereas the five young high technology companies (with combined sales of $857 million) showed a net increase of almost 35,000 jobs. The five innovative companies, with combined sales of $21 billion, created 106,000 new jobs.

"It is suggested that the concept of innovation within the large corporation is viewed mainly in terms of cost reductions and increased productivity in an effort to remain competitive," the report said. "In the small, technically-based new enterprise, innovation is a way of life and is responsible for the creation of new products, processes, and job opportunities."—LUTHER J. CARTER