by Mike May

The Ups and Downs of Industrial R&D

The success of U.S. industry and the country's overall economic growth depend heavily on technological innovations and advances. In large part, such progress emerges from R&D. Unfortunately, a recent report from the Congressional Research Service (CRS) says U.S. industry has been spending less on R&D.

On January 17, 1996, the CRS released "U.S. Industrial R&D: Trends and Analysis"—a report that examines general patterns in long-term (1955–1994) R&D spending based on data from the National Science Foundation (NSF) and short-term (1989–1994) R&D spending based on *Business Week's* annual survey of about 900 large corporations. These figures spawn an important question: Is the recent decline in industrial spending on R&D a true trend or just a minor downturn?

R&D Spending (millions of $)/percent change over previous year (constant $)

COMPANY	1989	1990	1991	1992	1993	1994
AT&T	2,652/–2	2,433/–12	3,114/2	2,911/–10	3,428/3	3,110/–3
Boeing	NA	NA	1,417/67	1,846/27	1,661/–13	1,704/0
Digital Equipment	1,525/12	1,614/1	1,649/–2	1,754/3	1,530/–16	1,301/–18
Eastman Kodak	1,253/4	1,329/1	1,494/8	1,587/3	1,301/–11	NA
Ford	3,167/3	3,558/7	3,728/1	4,332/13	5,021/13	5,214/1
General Electric	1,334/11	1,479/6	1,402/–9	1,353/9	1,297/–7	NA
General Motors	5,247/5	5,342/–3	5,887/6	5,917/–2	6,030/–1	7,036/14
Hewlett-Packard	1,269/15	1,367/3	1,463/3	1,620/8	1,761/6	2,027/12
IBM	5,201/13	4,914/–11	5,001/–2	5,083/–1	4,431/–16	3,382/–27
Motorola	NA	NA	NA	1,306/9	1,521/13	1,860/19

The CRS report says that "in recent years there has been a decline in the rate of growth" of industry's funding of R&D. In fact, the overall growth rate of industry-funded R&D was 0% for 1993 and 1994. Although two years do not necessarily make a trend, the years 1993 and 1994 were the only back-to-back years with 0% growth since 1955. However, similar slowdowns in industry's spending on R&D developed in the late 1960s, the mid-1970s, and the mid-1980s, and increased spending followed each of those periods.

Who's on top?

The ups and downs of industrial spending on R&D become more apparent when the CRS report discusses individual sectors of industry during 1989–1994. Growth in R&D spending can be found in a variety of industrial sectors: automotive, consumer products, electrical and electronics, food, health care, manufacturing, and service industries. Consistent decreases exist in other sectors: aerospace, conglomerates, fuel, and metals/mining.

The decreased spending even appears in the companies that spend the most money on R&D. (In the table NA indicates that a company was not in the top 10 that year). During each year from 1989–1994, at least 2 and as many as 6 of the top 10 companies spent less (in constant dollars) on R&D than they had the previous year. For example, General Motors was the biggest spender every year in terms of actual dollars, but, in constant dollars, its R&D spending decreased in three of those six years. Another big spender, IBM decreased its constant-dollar R&D spending in five of those six years.

On the other hand, some of the big spenders shelled out more. For example, Ford Motor Company and Hewlett-Packard Company increased their constant-dollar spending every one of those six years. Some companies even made big increases recently. For example, Motorola, Inc., increased its constant-dollar spending on R&D by 9%, 13%, and 19% in 1992, 1993, and 1994, respectively.

Although Boeing did not make the top 10 in1989 or 1990, it skyrocketed onto the list in 1991 with a 67% constant-dollar increase in its R&D spending. The CRS report attributed Boeing's spending spree to its development of the 777 jet, which continued into 1992, when Boeing increased its constant-dollar spending by another 27%. Nevertheless, Boeing's spending stalled after that.

Prophetic or premature?

The CRS report does not stand alone in calling attention to America's industrial spending on R&D. Both "The Future of America's Research-Intensive Industries" (an August 1995 report from the Institute for the Future) and "Endless Frontiers, Limited Resources: U.S. R&D Policy for Competitiveness" (a recent study from the Council on Competitiveness) encouraged industry to spend more on R&D. Despite such seeming agreement, the CRS report points out that "investments in R&D do not always guarantee business success, as evidenced by General Motors, which has the largest research and development budget of any U.S. firm but has steadily lost market share."

In any case, the decreased industrial R&D spending during the last few years may be part of another wrinkle in the historic fabric of spending. If it truly represents a downward trend, perhaps studies should concentrate more on *how* companies spend their R&D funds, which probably plays a more important role than the total amount spent. Based on the available data, it's premature to worry that the sky is falling in the world of industrial R&D spending.