

The NBER Digest

NATIONAL BUREAU OF
ECONOMIC RESEARCH, INC.

January 1993

Tax Incentives Can Raise Private R and D Spending

Since 1981 the U.S. tax code has provided credits to private firms to induce them to increase their R and D spending. In a new study for the NBER, **Bronwyn Hall** estimates that a permanent increase of 5 percent in the R and D tax credit would increase long-run private spending on R and D by about 5 to 10 percent. Further, most of the increase would occur during the first three or four years of the credit.

In **R and D Tax Policy During the Eighties: Success or Failure?** (*NBER Working Paper No. 4240*), Hall calculates the size of the subsidy provided to about 1000 of the largest manufacturing firms during 1980–91. Each firm's annual subsidy depends on the corporate tax rate, the size of the R and D credit, restrictions on what can be included in R and D, and interactions with the alternative minimum tax and the foreign tax credit. It also depends on recent growth in the level of the firm's R and D spending, and on whether the firm has taxable income.

Hall estimates that the effective credit provided to the average firm went from 3 percent in 1981 to about 7.4 percent in 1990–1. Based on these estimates, she calculates that the typical firm paid 96 cents for each dollar of R and D spending in 1981, and 93 cents for each dollar in 1990–1. The effect of these tax subsidies, according to Hall, was to raise private R and D spending by about \$2 billion per year, and to lower federal tax revenues by \$1 billion.

“A permanent increase of 5 percent in the R and D tax credit would increase long-run private spending on R and D by about 5 to 10 percent.”

Hall notes that R and D spending adjusts slowly to changes in tax rules and other economic circumstances, since many R and D projects cannot be stopped and started on short notice. Thus, she finds that the response to a tem-

porary change in the R and D tax credit is about half the response to a permanent change. This suggests that frequent changes in the tax code may reduce the effectiveness of tax credits in stimulating R and D spending.

Increased Schooling Pays Off

It pays to stay in school. Indeed, a new study by NBER Research Associates **Orley Ashenfelter** and **Alan Krueger** finds that each year of additional schooling increases an individual's wages by 16 percent, nearly double previous estimates.

Ashenfelter and Krueger conducted a survey of identical twins to ensure that the correlation found between schooling and wage rates was not really a correlation between schooling and other worker characteristics. They interviewed more than 495 individuals over the age of 18, looking especially for identical twins with a difference in the number of years of schooling.

In **Estimates of the Economic Return to Schooling from a New Sample of Twins** (*NBER Working Paper No. 4143*), the authors analyze the information gathered from these identical twins. They find that the wage rates and education levels of identical twins are more highly correlated than those of fraternal twins.

"Each year of additional schooling increases an individual's wages by 16 percent."

To measure schooling levels accurately, the authors asked the twins to report on both their own and their twin's schooling. During the interview, the twins were separated so that no twin heard the sibling's response to the questions. Some 49 percent of identical twins reported attaining exactly the same level of education, compared to 43 percent of fraternal twins. Seventy-four percent of identical twins had studied together during high school, far higher than the 38 percent of fraternal twins.

Ashenfelter and Krueger find no evidence that unobserved ability is positively related to the schooling level completed. They also find that conventional studies (not using twins) of the returns to schooling are not seriously biased because researchers do not control adequately for other family-related factors that might affect

earnings. Finally, measurement errors in self-reported differences in schooling result in a downward bias in conventional estimates of the returns to schooling, and an even larger downward bias in estimates based on twins.

Ashenfelter and Krueger base their analysis on interviews conducted at the 16th Annual Twins Day Festival in Twinsburg, Ohio, in August 1991. The festival, the largest gathering of twins in the world, attracted 3000 sets of twins, triplets, and quadruplets.

DRF

Price Shopping for Hospital Care Lowers Prices and Reduces Uncompensated Care

"Managed competition" in health care allows insurance companies to provide consumers with incentives to "price shop" when choosing doctors and hospitals. This competition can force hospitals to cut prices, according to a new NBER study by **Jonathan Gruber**. The hospitals then adjust to the lower prices they charge by providing less free medical care, but they do not lower the quality of care they provide or raise their charges to other insurance companies.

In **The Effect of Price Shopping in Medical Markets: Hospital Responses to PPOs in California** (*NBER Working Paper No. 4190*), Gruber explains that Preferred Provider Organizations (PPOs) act as middlemen between individual patients and providers of health care. By coordinating the demand of a large number of patients, PPOs gain market power that they use to negotiate discounts off the list prices of health care providers. In return for these discounts, PPOs channel patients to the "preferred providers." Since state governments began loosening regulations on price shopping in the early 1980s, potential enrollment in PPOs has grown twenty-fold, and one in three insured employees now has the option of enrolling in a PPO.

Gruber compares the prices charged by California hospitals in 1984, soon after PPOs were legalized, and in 1988. During that period, he finds, discounts rose from 2 percent of hospital revenues for nongovernment payers to over 11 percent. Discounts rose faster in areas such as Los Angeles County, where there is a lot of competition among hospitals, than in areas such as

northern California, where hospitals have larger market shares in their surrounding areas.

“Managed competition in the form of PPOs can lower the prices charged by hospitals, especially in areas with a lot of competition in hospital services.”

Gruber also finds that hospitals did not finance PPO discounts simply by shifting the burden to their commercially insured and Blue Cross customers. Net average revenues for these hospitals actually fell. Nor were the discounts financed by cutting the quality of care. Length of hospital stays, and other quality measures for private patients with different illnesses, were not affected by the price discounting, Gruber reports.

Hospitals typically have financed uncompensated care—free care and bad debt—by charging higher prices to paying customers. By offering lower prices to certain insured customers, hospitals thus face pressure to cut uncompensated care. Gruber finds that California hospitals did just that: for every dollar in discounts, they reduced uncompensated care by about 50 cents. One way they did so was by reducing access to emergency rooms, which are used disproportionately by the uninsured. Such visits fell by 14 percent in Los Angeles relative to northern California because of increased competitive pressure.

Gruber concludes that managed competition in the form of PPOs can lower the prices charged by hospitals, especially in areas with a lot of competition in hospital services. However, much of the saving in lower prices comes from reducing care for the uninsured, rather than from reducing the cost of treating patients insured by PPOs. He contrasts this with the experience of Medicare's Prospective Payment System, which tries to control costs by setting prices for treating different types of illnesses. This approach, he finds, led to a large fall in hospital costs over this era, with no effect on uncompensated care. DRH

Education and Foreign Investment Spur Growth in Developing Countries

The nightly news seems to suggest that most poor countries are condemned to continuing

poverty, while only a few relatively well-off developing countries will be able to escape this fate and approach the level of the world's rich countries. However, a new NBER study by **Magnus Blomström, Robert Lipsey, and Mario Zejan** finds several factors that have promoted faster growth even in developing countries.

In **What Explains Developing Country Growth?** (*NBER Working Paper No. 4132*), the authors review the experience of 78 developing countries since 1960. For the poorest half of the countries, they find, increasing the proportion attending secondary school and raising the ratio of workers to dependents tend to raise the rate of growth of per capita income.

Typically, developing countries with increasing birth rates have declining numbers of workers per dependent, because an increasing fraction of the population is too young to work. Blomström, Lipsey, and Zejan find that, as a group, the poorest countries also have low rates of growth in per capita income. But, given the rate of school attendance and changes in the ratio of workers to dependents, the poorer the country is initially, the faster it grows, they find.

“For the poorest half of the countries, . . . increasing the proportion attending secondary school and raising the ratio of workers to dependents tend to raise the growth of per capita income.”

In middle-income countries (that is, the upper half of the developing countries), secondary school attendance and changes in the dependency ratio had smaller effects on growth, they observe. But the rate of investment in plant and equipment in these countries, and of inflows of foreign direct investment (FDI), had significant positive influences on growth rates.

These middle-income countries are the major recipients of FDI in the Third World. The authors suggest that a certain threshold of development may be necessary before host countries can absorb new technology from investment by foreign firms. The poorest countries may not have the human capital to absorb technology from the industrial world, but the middle-income countries' workers and firms may be advanced enough to learn from foreigners. RN

New NBER Book

Bretton Woods Book Is Available

A Retrospective on the Bretton Woods System: Lessons for International Monetary Reform, edited by Michael D. Bordo and Barry J. Eichengreen, is now available from the University of Chicago Press. This volume is particularly relevant to current discussions concerning the future of the European Monetary System and the turbulence it experienced this fall. Nearly 50 years ago, in 1944, delegates from 44 countries assembled in Bretton Woods, New Hampshire to attend a United Nations Monetary and Financial Conference. The focus of their meeting was negotiation of a "new world order," to help industrialized countries emerging from World War II to cope with trade and capital imbalances and to supervise a system of fixed exchange rates that came to be known as the Bretton Woods System. In August 1971, President Nixon suspended the system by ending the convertibility of dollars into gold, thus cutting exchange rates loose.

The papers in the Bordo/Eichengreen volume were presented at a 1991 NBER conference that brought together academics and policymakers to discuss the

historical impact of the Bretton Woods System. This book is divided into four sections: 1) an overview of the Bretton Woods System; 2) the successful operation of Bretton Woods, and the causes of its collapse; 3) the Bretton Woods experience in light of subsequent monetary regimes; and 4) an epilogue by Eichengreen summarizing the volume's main findings and their implications for monetary reform today.

Both Bordo and Eichengreen are NBER research associates in the monetary economics program. Bordo is also a professor of economics at Rutgers University; Eichengreen is a professor of economics at the University of California, Berkeley.

This volume is priced at \$75.00 and may be ordered directly from the University of Chicago Press, Order Department, 11030 South Langley Avenue, Chicago, IL 60628. Academic discounts of 10 percent for individual volumes and 20 percent for standing orders for *all* NBER books published by the University of Chicago Press are available to university faculty; orders must be sent on university stationery.

NBER

The National Bureau of Economic Research is a private non-profit research organization founded in 1920 and devoted to objective quantitative analysis of the American economy. Its officers are:

*Chairman—George T. Conklin, Jr.
Vice Chairman—Paul W. McCracken
Treasurer—Charles A. Walworth*

*President and Chief Executive Officer—Martin Feldstein
Executive Director—Geoffrey Carliner
Director of Finance and Administration—Sam Parker*

Contributions to the National Bureau are tax deductible. Inquiries concerning the contributions may be addressed to Martin Feldstein, President, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398.

The NBER Digest summarizes selected Working Papers recently produced as part of the Bureau's program of research. Working Papers are intended to make preliminary research results available to economists in the hope of encouraging discussion and suggestions for revision. The Digest is issued for similar informational purposes and to stimulate discussion of Working Papers before their final publication. Neither the Working Papers nor the Digest has been reviewed by the Board of Directors of the NBER.

The Digest is not copyrighted and may be reproduced freely with appropriate attribution of source. Please provide the NBER's Public Information Department with copies of anything reproduced.

Preparation of the Digest is under the supervision of Donna Zerwitz. The articles indicated by DRF, DRH, and RN were prepared with the assistance of David R. Francis, David R. Henderson, and Rob Norton, respectively.

Abstracts of all current NBER Working Papers appear in the NBER Reporter. Individual copies of the NBER Working Papers summarized here (and others) are available free of charge to Corporate Associates. For all others, there is a charge of \$5.00 per paper requested. (Outside of the United States, add \$10.00 per order for postage and handling.) Advance payment is required on orders. Please do not send cash. For further information, please contact: Working Papers, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138-5398; (617) 868-3900.

Requests for Digest subscriptions, changes of address, and cancellations should be sent to Digest, NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138. Please include the current mailing label.