



The Vital Role of Government in U.S. Economic Innovation

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Can government encourage innovation and economic growth, or is it just a drag and an obstacle? For more than a generation, U.S. conservatives have clamored for tax cuts and reductions in government spending. Public spending on research has been falling, and today's Tea Party-infused GOP insists that the market must be further "liberated" from all "government interference." But will business entrepreneurs operating on their own really propel a new burst of growth, if the U.S. government just gets out of the way?

Where Marketable Innovations Come From

It has not been easy for social scientists to measure economic innovation. Counting the dollars spent on research and development can mistake inputs for results; and adding up patents includes too many trivial inventions that fail to make it to the market. We have used more promising data. For more than forty years, R&D Magazine has made annual juried awards to the top 100 innovations embodied in products newly brought to market in the preceding year. We looked at award-winning breakthroughs involving at least one U.S. sponsor for three separate years in each decade from the 1970s to the early 2000s. We classified about 1200 innovations, recording whether each was developed by a Fortune 500 company, a smaller private firm, or by a private collaboration. We also coded products that emerged from breakthroughs in government laboratories, university laboratories, and collaborations and spin-offs involving public support.

Our results document striking shifts in marketable innovations. The innovative role of Fortune 500 firms has declined sharply, while award-winning new products increasingly come from federal laboratories and spin-offs, operating alone or in partnerships. For the year 2006, we were able to identify federal contributions to 77 of the 88 award-winning innovations. In 42 of those instances, researchers in federal laboratories made the key breakthroughs – either by themselves or working with private firms. What is more, many of the awards attributed solely to private firms went to breakthroughs from particular research groups that had received federal support.

Do What Conservatives Do, Not What They Say

In America's ongoing ideological battles, liberals have a hard time answering conservative demands to halt all government interference in the market. But tongue-tied liberals are paying too much attention to what conservatives say and not enough heed to what they actually do when they control the federal government. Even as right-wing politicians loudly insist that government must never pick winners in the market, federal agencies operating under Republican as well as Democratic presidents have allocated billions of dollars each year to accelerate technological development along certain pathways. Government initiatives operate across dozens of different agencies and thousands of distinct offices, influencing product development in every corner of the economy.

- Federal investments often support innovations for national security purposes unquestioningly favored on the right. But the agencies involved have long prioritized "dual use" technologies that can also flourish in the commercial marketplace. Under both Bill Clinton and George W. Bush, for example, the Central Intelligence Agency used a venture-capital arm called In-Q-Tel to invest in about 90 high-technology start-ups, including the firm that developed the software behind Google Earth.
- Civilian agencies also jump-start innovative products. Since the first Bush administration, the Department of Energy has shared research and development costs with private firms to nurture technologies that promise to increase energy efficiency. Such public subsidies have made solar power, harvested with photovoltaic cells, increasingly cost-effective.

- In the health sector, most of the new biotechnology drugs introduced in the last two decades are a direct result of discoveries from labs run by the National Institutes of Health or from university labs supported by NIH grants. The government also supports pharmaceutical firms to run the clinical trials required to get marketable drugs approved.
- Recently, more than a quarter of R&D Magazine award winners have been firms helped by a little-known program called Small Business Innovation Research. Started under Reagan, this wildly successful federal program gives about \$2 billion a year to small firms trying to commercialize new technologies. There are now about 6,000 awards each year, including small grants to test the viability of ideas and larger follow-up grants to get workable ideas to market.

Growth beyond Fantasy

The Tea Party vision of a private sector divorced from government is, in short, an outmoded fantasy. Almost all of the recent breakthrough technologies successfully marketed by U.S. firms enjoyed crucial government support for the original research and steps toward commercialization. When you look closely at your iPhone, your new car, or a major appliance, you see technologies that were nurtured to commercial fruition by support from public sector agencies. The lesson could not be clearer. The health of America's private sector in this new century depends on the continuation of public investments in research and commercialization. We will not be able to create new industries – and the many new jobs they bring – if we cut the federal budget to the bone.

Read more in Block and Keller, "Where Do Innovations Come From? Transformations in the U.S. Economy, 1970-2006," *Socio-Economic Review* 7, no. 3 (2009): 459-83.