



Academic-Industry Patent Licensing Contributed up to \$1.18 Trillion to U.S. Economy Since 1996

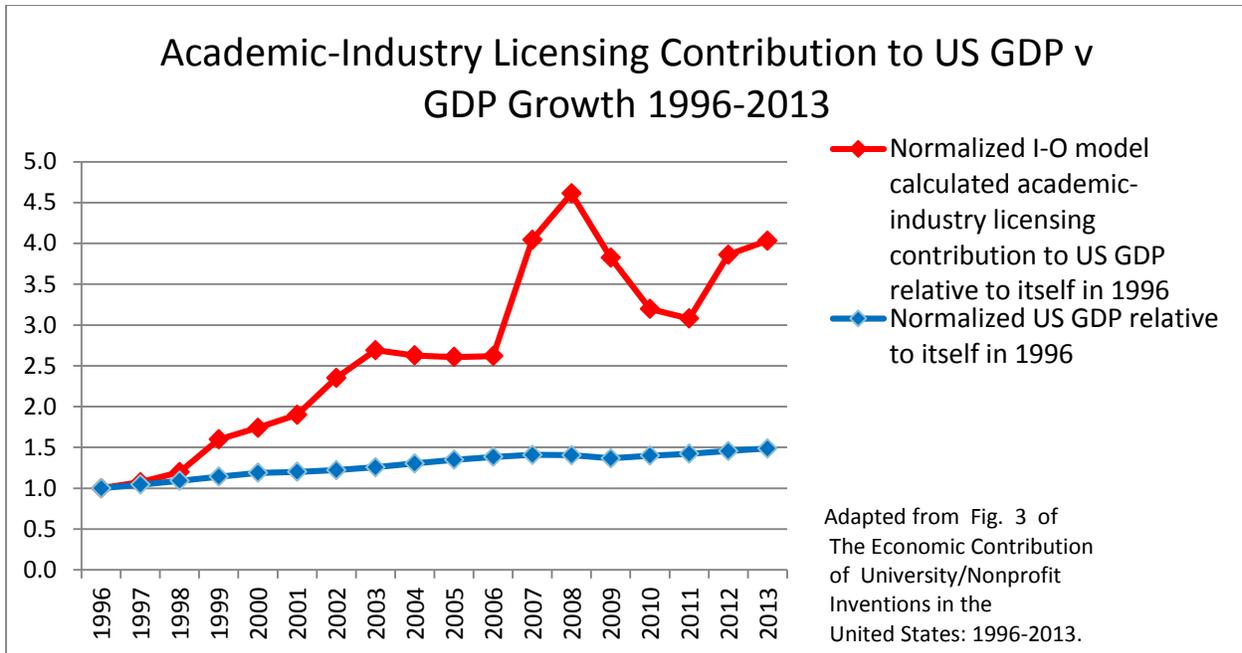
A newly released study, commissioned by the Biotechnology Industry Organization (BIO), documents the significant impact academic¹ technology transfer makes on the U.S. economy. ["The Economic Contribution of University/Nonprofit Inventions in the United States: 1996-2013"](#) estimates that, during this 18-year time period, academic-industry patent licensing bolstered U.S. gross industry output by up to *\$1.18 trillion*, U.S. gross domestic product (GDP) by up to *\$518 billion*, and supported up to *3,824,000 U.S. jobs*.

This new estimate demonstrates an impressive increase in economic benefits from the commercialization of academic inventions in the three years since BIO released a similar study. The [previous report](#), conducted by the same independent expert team,² found that academic patent licensing between 1996 and 2010 contributed up to \$836 billion to gross industry output, up to \$339 billion to GDP, and to the support of up to three million jobs. Due to growth in academic-industry licensing activity, *the newly released numbers show about a 20% increase in the licensing contribution to U.S. gross industry output and GDP, with an 11% increase in jobs supported.*

The chart below demonstrates that academic-industry licensing contributions to U.S. GDP grew faster than GDP as a whole from 1996-2013:

¹ University and Hospital and Research Institute respondents to the Association of University Technology Managers (AUTM) annual licensing survey.

² The studies were done by a team led by Lori Pressman, an independent business development, licensing and strategy consultant who formerly served as Assistant Director of the MIT Technology Licensing Office, Mark Planting, former chief of research on the use of U.S. input-output accounts at the Department of Commerce's Bureau of Economic Analysis, Dr. David Roessner, Professor of Public Policy Emeritus, Georgia Institute of Technology and Senior Fellow, Science and Technology Policy Program at SRI International, Jennifer Bond, Senior Advisor for International Affairs for the Council on Competitiveness and former Director of the Science & Engineering Program at the National Science Foundation, and Dr. Sumiye Okubo, former Associate Director for Industry Accounts at the Bureau of Economic Affairs at the U.S. Department of Commerce.



These economic impact estimates draw on licensing surveys conducted by the Association of University Technology Managers (AUTM), a recognized leader in supporting and advancing academic technology transfer globally. The latest AUTM survey for activities in 2013 vividly illustrates the annual contribution of academic patent licensing to the nation. It found:

- 818 start-up companies formed around academic patents (up 16% from 2012) – *which is more than two new companies created every working day of the year;*
- 4,200 start-ups in operation, mostly located in the same state as the parent research institution, creating regional economic development;
- \$22.8 billion in product sales from commercialized academic inventions; and
- 719 new products introduced into the market (up 22% from 2012) – *or more than two new products introduced every day of the year.*

As the numbers illustrate, academic-industry partnerships are a critically important part of our economy. The U.S. leads the world in the commercial development of academic



research. More than 70% of academic inventions are licensed to small companies that commercialize the breakthrough discoveries, creating new industries and products and keeping the United States competitive in the world economy. Academic inventions play a critical role in the creation of spin-off companies that drive state, regional, and national economic growth.

These economic impact numbers also reflect the unparalleled success of the Bayh-Dole Act. Passed in 1980, this Act allows academic institutions and small companies to own and manage patentable inventions made with federally supported research. Congress found that the incentives of the patent system are crucial to drive academic technology commercialization. Bayh-Dole begins by stating: "It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research...."

Before Bayh-Dole, few taxpayer-supported discoveries were developed into useable products because the federal government's policy was to take the patent rights away from their creators and make the invention freely available to the public through non-exclusive licenses. This approach destroyed the intended incentives of the patent system. As a result, more than 28,000 federally-funded inventions prior to Bayh-Dole sat idly on the laboratory shelf. The Senate Judiciary Committee, which led the effort to enact the Bayh-Dole Act, found during its investigation that *not a single new drug was commercialized* from federally-supported research under the old system in which patent rights were taken away from the academic institutions.

The reasons for this failure are not hard to understand. Academic inventions are normally very early-stage discoveries requiring significant private sector investment and risk to transform them from laboratory concepts into useful products. It is estimated that it costs companies many multiples of the initial federal investment in academic research to conduct the further R&D necessary to commercialize such inventions. If the discovery leads to a new potential drug, the industry-incurred costs skyrocket to well over \$2 billion on average, with more than a decade's worth of R&D and clinical testing required before the company can reap any rewards. Even then, the odds of failure are



much greater than the odds of success. Experience shows that, absent the incentives of patent ownership or exclusive licenses, companies and their investors simply cannot justify this effort.

Recognizing this reality, in 1980 the U.S. Congress, with an overwhelming bipartisan consensus, decided that the United States could no longer afford to waste the benefits of billions of dollars of taxpayer-funded R&D. It passed the Bayh-Dole Act, and the impact of the law in spurring academic-industry collaboration and commercialization was immediate. *The Economist Technology Quarterly* called the Bayh-Dole Act “[p]ossibly the most inspired piece of legislation to be enacted over the past half-century.... More than anything, this single policy measure helped to reverse America’s precipitous slide into industrial irrelevance.”³

While academic patent licensing results in important new discoveries in virtually every field of technology, perhaps its most meaningful impact has been in the field of life sciences. As noted above, no new drugs were developed from the substantial federal investment in biomedical research under previous patent policies; however, according to an article in [*The New England Journal of Medicine*](#), since the passage of the Bayh-Dole Act, at least 153 new drugs and vaccines arising from taxpayer-funded research are now fighting the scourge of disease both here at home and around the world.

Partnerships between academic institutions and industry are particularly important in biotechnology. Many biotechnology companies actively license academic technologies and some of the most prominent biotechnology companies spun out of universities and nonprofit research institutes.

Indeed, the U.S. biotechnology industry formed around academic discoveries in the early 1980s and remains clustered near academic research centers throughout the country. The ability to commercialize these academic inventions under the provisions of the Bayh-Dole Act and the protections of the U.S. patent system are key reasons why the

³ <http://www.economist.com/node/1476653>



United States leads the world in capitalizing on the promise of biotechnology to feed a hungry world, protect the environment, and create breakthrough cures and treatments for so many deadly and debilitating diseases.

While the impact of the Bayh-Dole Act is often unknown or underappreciated here at home, our economic rivals are fully aware of what this law has done to bolster our global competitiveness. China, Japan, South Korea, the Philippines, South Africa, Singapore, Italy, Malaysia and others have adopted Bayh-Dole-type laws to better integrate their public sector research institutions into their economies.

As this newly-released economic study demonstrates, the United States greatly benefits from the extensive collaboration between America's academic research centers and our entrepreneurial ecosystem of inventors, start-up companies, and investors. The Bayh-Dole Act and the incentives of a strong and reliable patent system are the solid foundation upon which such economic success has been gained. If our nation continues to protect this foundation, there is every reason to believe that the new products, companies, and jobs arising from our unparalleled public sector research institutions will continue to provide even greater benefits to the U.S. economy, and to humankind, well into the future.