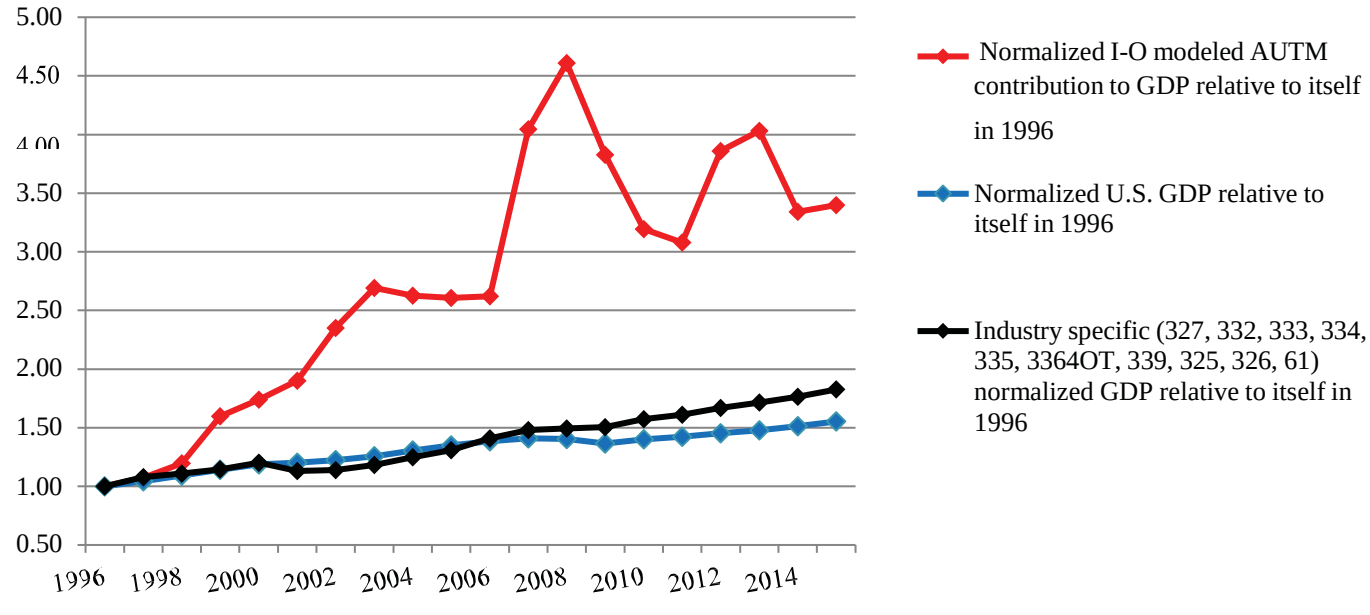
Academic-Industry Partnerships Contributed $1.33 Trillion, Supported 4.2 Million Jobs Since 1996

The latest in a series of studies commissioned by the Biotechnology Innovation Organization (BIO) and the Association of University Technology Managers (AUTM) found that academic inventions commercialized by the private sector are significant drivers of the U.S. economy. "*The Economic Contribution of University/Nonprofit Inventions in the United States: 1996-2015*" estimates that during this 20 year period, academic-industry partnerships contributed as much as $1.33 trillion to U.S. industry gross output, $591 billion to the gross domestic product while supporting 4,272,000 jobs.

Equally impressive is that the impact on industry gross output and gross domestic product increased 14% since the previous study two years ago while the impact on jobs supported was up 12%. Such significant increases at a time when the overall U.S. economy was in the doldrums shows the resiliency of academic-industry partnerships. A chart from the study comparing the impact of academic-industry licensing on the gross domestic product with overall economic growth vividly illustrates the point:

Selected GDP Trends 1996-2015, Comparison of Normalized: i) US GDP, ii) Industry Specific (selected manufacturing and educational services) contribution to GDP and iii) I-O Model Calculated AUTM Respondent Contribution to US GDP



The economic impact study draws on licensing surveys conducted by AUTM, a recognized leader in supporting and advancing academic technology transfer globally. Over the past 25 years academic inventions led to the formation of 11,000 startups and to the commercialization of more than 10,000 new products.

The AUTM FY 2015 survey[1] found:

- 1,012 startup companies were formed, *averaging 2.75 new companies created every day of the year*-- up 11.3% from FY 14;
- 879 new products based on academic inventions were introduced to the marketplace, *averaging 2.4 new products introduced every day of the year;*
- Products based on academic patent licenses generated more than $28.7 billion in net product sales; and
- 7,942 new licenses and options were executed, up 15% from FY 14. More than 70% of academic patent licenses go to small companies.

Academic-industry partnerships have benefitted all technology sectors, but the greatest impact has been in establishing the United States as the world leader in the life sciences. Research and development partnerships are one of strongest pillars of our biotechnology industry which clusters around centers of academic research. Many of our biotechnology companies either spun off campus or were founded upon academic inventions.

While academic research is critical to this success, the real heroes of our system are the private sector entrepreneurs who undertake the risk and expense needed to move early stage academic inventions from the laboratory into the marketplace. It's estimated that industry spends $100 dollars on development for every $1 the government spent supporting the research leading to the discovery.[2] That should not be surprising, particularly considering the risks of developing a new drug. It's estimated that of every 10,000 compounds about 250 make it to preclinical testing, 5 proceed to clinical trials and just 1 enters the marketplace. Of these, only 20% earn a profit and must pay the expenses for all that died in the pipeline.[3] These costs are borne by the private sector. Developing a new drug is estimated to cost companies between $800 million to over $2 billion dollars over a decade or more of development.

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[1] "AUTM - FY2015 Licensing Survey". *Association of University Technology Managers*, 1 March. 2017. http://www.autm.net/fy2015-survey.

[2] Chatterjee, Sabarni K., and Mark L. Rohrbaugh. "NIH inventions translate into drugs and biologics with high public health impact." *Nature Biotechnology.* 32.1 (2014): 52-58. (http://www.nature.com/nbt/journal/v32/n1/full/nbt.2785.html?message-global=remove)

[3] Allen, Joseph. "Fumbling Away the Future." *IP Watchdog,* 10 Dec. 2014 (http://www.ipwatchdog.com/2014/06/22/fumbling-away-the-future/id=50149/)

The impressive growth of academic-industry research partnerships is based on the Bayh-Dole Act, called "Possibly the most inspired piece of legislation to be enacted in America over the past half-century" by the Economist Technology Quarterly[4] and a reliable patent system. Before Bayh-Dole, few government funded inventions were ever brought to the marketplace and not a single new drug was created from government funded university research during the time in which the government claimed all rights in university inventions. Since Bayh-Dole injected the incentives of patent ownership by allowing academic institutions to own and manage their inventions, more than 200 new drugs and vaccines have been commercialized. Academic-industry partnerships, in which businesses shoulder at staggering costs the burden of developing basic research tools into real-world solutions to combat illness and disease, are the backbone of the U.S. life science industry and are a major reason why we lead the rest of the world in bringing lifesaving technologies to suffering patients here and around the world.

The study is the fourth in a series produced by a team of senior economic consultants and technology transfer experts.

At a time when our patent system is under stress and some call for weakening the Bayh-Dole Act, the newly released study offers clear evidence of the importance of academic-industry partnerships to the nation. If our system of technology commercialization is protected and cherished, there's every reason to believe that the impacts on the economy will continue to grow as will the benefits to our prosperity and well-being.

[4]"Innovation's golden goose." *The Economist*, 14 Dec. 2002. Web. (http://www.economist.com/node/1476653)