

The Economic Impact of the Bayh-Dole Act

*How University and Nonprofit Inventions that
Benefit from Federal Funding Drive American
Innovation, Jobs, and Economic Growth*

1996-2025



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Executive Summary

The findings are based on self-reported data and do not capture the full impact of patent licensing by U.S. academic institutions and HRIs during the period surveyed. As a result, the figures underestimate the actual impact.

30-YEAR DATA FROM 1996-2025

Between 1996 and 2025, Bayh-Dole-enabled technology transfer from university and nonprofit research that benefited from federal funding added as much as:



\$3.3 TRILLION

to U.S. gross economic output



\$1.7 TRILLION

to U.S. GDP



7.6 MILLION JOB-YEARS

of U.S. employment

5-YEAR DATA FROM 2021-2025

From 2021 through 2025 alone, Bayh-Dole-enabled technology transfer from university and nonprofit research that benefited from federal funding added as much as:



\$577 BILLION

to U.S. gross economic output



\$288 BILLION

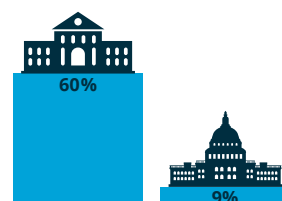
to U.S. GDP



1.08 MILLION JOB-YEARS

of U.S. employment

Since 1980, the annual number of patents issued on inventions benefiting from federal funding has increased more than 70-fold. Before Bayh-Dole, the federal government owned most of such patents; **by 2025, universities owned approximately 60%, compared with roughly 9% held by the federal government.**



Between 2000 and 2024, federal agencies including the Department of Defense, Department of Energy, NIH, NASA, and NSF invested nearly **\$1.8 trillion** in federal research, generating more than **155,000** patents.

From 2001 to 2025, Bayh-Dole-enabled technology transfer at academic institutions has led to:



19,027

startups launched



17,252

new products introduced

From 2021 through 2025, universities, hospitals, and nonprofit research institutes averaged:

19,378

income-generating licenses

5,972

running royalty licenses

\$3.2 BILLION

in annual gross licensing income

\$1.9 BILLION

in annual running royalty income

Background

For more than 45 years, the Bayh-Dole Act has served as the foundation of the American technology transfer system and a backbone of U.S. innovation. By allowing nonprofit organizations, such as academic research institutions, small businesses, and federal laboratories, to retain the patent rights to inventions benefiting from federally funded research, this legislation has enabled and incentivized the public-private collaborations required to transform scientific discoveries into new technologies, and even new industries, products and new companies driving American innovation.

Before Bayh-Dole, the federal government took ownership of most inventions made with federal support. It held the patents on roughly 28,000 discoveries, yet licensed [fewer than 5%](#) for commercialization. The Bayh-Dole Act ended this mismanagement by decentralizing patent ownership to the academic institutions, small companies, and federal laboratories that had originally developed the inventions. That led to an explosion in both licensing and commercialization. This change did not expand the federal bureaucracy or impose any additional costs on taxpayers, and it helped launch one of the greatest innovation renaissances in history, restoring the leadership the United States was at risk of losing to its international competitors.

As America faces increasing pressure to compete with our global rivals, some policymakers have suggested that our federal R&D system should be re-centralized in Washington to make commercialization more effective. Before changing Bayh-Dole's proven model, however, it is important to understand what that landmark law has been quietly accomplishing year after year. To better inform this debate, the Bayh-Dole Coalition commissioned this report to answer a fundamental question: *What economic value has the Bayh-Dole system actually generated for the American public?*

To help answer that question, the Bayh-Dole Coalition asked Vital Transformation to update the landmark 2022 analysis *"Economic Contributions of University/Nonprofit Inventions in the United States: 1996-2020,"* prepared for the Biotechnology Innovation Organization (BIO) and AUTM by Lori Pressman, Mark Planting, Carol Moylan and Jennifer Bond. That report relied on data from AUTM's annual licensing surveys of its members. These surveys are the most comprehensive source of data available; however, because participation is voluntary and not all academic institutions respond, the resulting numbers underestimate the actual economic impact of academic patent licensing.

Using the 2022 report's established methodology, this analysis examines five additional years of AUTM licensing survey data to assess how the commercialization of patented inventions supported by federally funded research at American universities and nonprofit hospitals and research institutes (HRIs) has continued contributing to U.S. economic growth through 2025.

The findings demonstrate that the Bayh-Dole Act has generated substantial and sustained returns for the American economy. Between 1996 and 2025, technology transfer associated with research that benefited from federal funding generated up to **\$3.3 trillion** in gross economic output, contributed as much as **\$1.7 trillion** to U.S. gross domestic product, and supported as many as **7.6 million** job-years.

This impact is broadly distributed across the country. From 2021 through 2025, universities and nonprofit hospitals and research institutes across the four U.S. census regions collectively generated billions of dollars in licensing income. Meanwhile, in the twenty-five years from 2001 to 2025, those regions launched thousands of startups and brought thousands of new products to market. The state-by-state and territory data explored in this report further demonstrates how the Bayh-Dole framework translates research that benefits from federal funding into tangible economic and innovation benefits for communities across the country. Importantly, approximately [70%](#) of academic licensing agreements are with small companies, which have historically been among the strongest drivers of American innovation. Many of these companies are spun out of universities and remain in the states and regions where they were founded, becoming important engines of local economic growth, job creation, and innovation.

Between 1996 and 2025, patented inventions benefiting from federal funding entered the marketplace at unprecedented levels. Annual patenting of these inventions has increased more than **70-fold** since Bayh-Dole's enactment, with federal agencies supporting more than **155,000 patents** in total from 2000 to 2024. Universities and academic research institutions also continue to expand technology transfer through growing licensing activity and commercialization.

Beyond these numeric measures, this report demonstrates how Bayh-Dole transformed the nation's innovation system. By creating clear incentives for commercialization and public-private partnerships, as well as establishing a uniform policy for all government agencies, the Act has enabled discoveries that benefited from federal funding to become products and services that strengthen public health, national security, manufacturing, agriculture, energy, and other sectors of the economy. The resulting innovation system supports economic activity in every state while helping ensure that publicly funded research delivers tangible benefits to society. Bayh-Dole's success has also made it an international model, with countries around the world adopting similar approaches for the management and commercialization of technologies that are supported by government funded research.

The evidence presented in this report demonstrates that the Bayh-Dole Act is not simply a patent policy — it is one of the nation's most successful drivers of innovation, generating substantial returns for taxpayers while strengthening America's long-term economic competitiveness.

Methodology

This report updates the 2022 analysis *“Economic Contributions of University/Nonprofit Inventions in the United States: 1996-2020,”* prepared for the Biotechnology Innovation Organization (BIO) and AUTM by Lori Pressman, Mark Planting, Carol Moylan and Jennifer Bond, by incorporating five additional years of data through 2025. This report applies the same input-output (I-O) economic modeling framework to estimate the economic impact of intellectual property (IP) licensing by U.S. universities and HRIs.

Using running royalty income and other licensing data reported through the AUTM Licensing Activity Survey and economic multipliers from the U.S. Bureau of Economic Analysis (BEA), the model estimates the contributions associated with the licensing and commercialization of intellectual property to U.S. gross domestic product (GDP), gross economic output (GEO), and employment. Patent analyses draw on data from Clarivate’s Derwent Patent Search, NIH RePORTER, and USAspending.gov.

Because sales figures for licensed products are not readily available, the analysis estimates the value of licenses using assumed average royalty rates of 2-5%. Given that many Bayh-Dole licensees are multinational enterprises (MNEs), the report also presents results using multiple assumptions about the share of commercial production occurring within the United States.

A complete description of the methodology, assumptions, and data sources used is provided in the Appendix.

Key Terms

Bayh-Dole Act:

The 1980 law that allows nonprofit organizations, including universities, federal laboratories, and small businesses to retain patent rights on their inventions benefiting from federally funded research.

Commercialization:

The process of developing and bringing a research discovery to the marketplace as a product, service, or technology.

Gross domestic product (GDP):

The value of goods and services produced within the United States.

Gross economic output:

The total value of economic production, including transactions between businesses.

Gross licensing income:

Total income received from licensing intellectual property, including running royalties as well as upfront payments, milestone payments, annual maintenance fees, and other licensing-related payments.

HRIs:

Hospitals and Research Institutes

Income-generating licenses:

Licenses or options that generate any form of licensing income for a university or HRI, including running royalties, upfront fees, milestone payments, maintenance fees, or other licensing-related payments.

Intellectual property (IP):

Legally protected property such as a concept, idea, invention, or work that derives from the effort of the mind or intellect.

Job-year:

One year of full-time employment for an individual.

Licensing agreement:

A legal contract where one party (the licensor) gives another party (the licensee) permission to use their intellectual property such as patents, trademarks, or copyrights. In exchange, the licensee typically pays the licensor compensation, such as upfront fees or ongoing royalties.

MNE:

Multinational enterprise

Royalty rate:

The percentage of revenue or a fixed fee paid by a licensee to a licensor for the right to use their IP under a licensing agreement.

Running royalty:

An ongoing payment made by the licensee to the licensor based on a predetermined formula tied to commercial activity, such as product sales, revenue, or units produced.

Running royalty licenses:

Licenses or options that generate ongoing royalty payments tied to commercial activity, such as product sales, revenue, or units produced.

Technology transfer:

The process of moving scientific discoveries from research institutions to the private sector so they can be developed, manufactured, and made available to the public.

Findings

The Bayh-Dole Act transformed how inventions that benefit from federal funding move from discovery to commercialization. The findings below demonstrate the economic impact of that system, illustrating how the Bayh-Dole framework has expanded patenting activity, strengthened technology transfer, increased licensing activity, and encouraged public-private partnerships that move discoveries benefiting from federal funding into the marketplace. Together, these findings show how the Act continues to drive American innovation, economic growth, and U.S. competitiveness.

The Bayh-Dole framework has generated trillions of dollars in economic activity.

Between 1996 and 2025, technology transfer of discoveries benefiting from federal funding at U.S. universities and HRIs has contributed an estimated **\$1.3-\$1.7 trillion** to U.S. GDP, generated **\$2.4-\$3.3 trillion** in gross economic output, and supported the equivalent of **5.7-7.6 million** job-years. These findings demonstrate that the commercialization of patented discoveries benefiting from federal funding has become a major contributor to the U.S. economy.

Importantly, Bayh-Dole’s economic impact continues to grow. From 2021 through 2025 alone, Bayh-Dole-enabled technology transfer generated an estimated **\$212-\$288 billion** in GDP, **\$419-\$577 billion** in gross economic output, and supported **797,000-1.08 million** job-years. This demonstrates that recent discoveries are driving meaningful economic growth.

FIGURE 1
University and HRI Contribution to GDP (1996-2025)

Value	Earned Royalty Rate	One-half of licensees are MNEs	All licensees are MNEs
		Mil. 2025 \$U.S.	Mil. 2025 \$U.S.
Total (1996-2025)	2%	\$1,679,685	\$1,251,622
Annual Average (1996-2025)		\$55,990	\$41,721
BIO 2022 Report Total (1996-2020)		\$1,392,086	\$1,039,386
Total Gain (2021-2025)		\$287,599	\$212,236
Annual Avg Gain (2021-2025)		\$57,520	\$42,447
Total (1996-2025)	5%	\$726,419	\$553,849
Annual Average (1996-2025)		\$24,214	\$18,462
BIO 2022 Report Total (1996-2020)		\$601,716	\$460,504
Total Gain (2021-2025)		\$124,703	\$93,345
Annual Avg Gain (2021-2025)		\$24,941	\$18,669

University and HRI Contribution to Employment (1996-2025)

Value	Earned Royalty Rate	One-half of licensees are MNEs	All licensees are MNEs
		<i>Person Years</i>	<i>Person Years</i>
Total (1996-2025)	2%	7,579,000	5,741,000
Annual Average (1996-2025)		253,000	191,000
BIO 2022 Report Total (1996-2020)		6,498,000	4,944,000
Total Gain (2021-2025)		1,081,000	797,000
Annual Avg Gain (2021-2025)		216,000	159,000
Total (1996-2025)	5%	3,497,000	2,753,000
Annual Average (1996-2025)		117,000	92,000
BIO 2022 Report Total (1996-2020)		2,981,000	2,356,000
Total Gain (2021-2025)		516,000	397,000
Annual Avg Gain (2021-2025)		103,000	79,000

University and HRI Contribution to Gross Output (1996-2025)

Value	Earned Royalty Rate	One-half of licensees are MNEs	All licensees are MNEs
		<i>Mil. 2025 \$U.S.</i>	<i>Mil. 2025 \$U.S.</i>
Total (1996-2025)	2%	\$3,275,099	\$2,429,469
Annual Average (1996-2025)		\$109,170	\$80,982
BIO 2022 Report Total (1996-2020)		\$2,698,673	\$2,010,968
Total Gain (2021-2025)		\$576,426	\$418,501
Annual Avg Gain (2021-2025)		\$115,285	\$83,700
Total (1996-2025)	5%	\$1,396,215	\$1,055,543
Annual Average (1996-2025)		\$46,540	\$35,185
BIO 2022 Report Total (1996-2020)		\$1,148,373	\$873,319
Total Gain (2021-2025)		\$247,841	\$182,224
Annual Avg Gain (2021-2025)		\$49,568	\$36,445

Note. Numbers reflect \$U.S. Million (2025). “All licensees are MNE” assumes, on average, roughly 58% of licensee products are domestically produced. “One-half of licensees are MNE” assumes, on average, roughly 79% of licensee products are domestically produced.

The estimated economic contributions of federally funded research extend well beyond the universities and research institutions where discoveries originate. Commercializing patented inventions that benefited from federal funding stimulates investment throughout the broader economy as companies manufacture products, build facilities, hire workers, establish supply chains, and bring new technologies to market. These

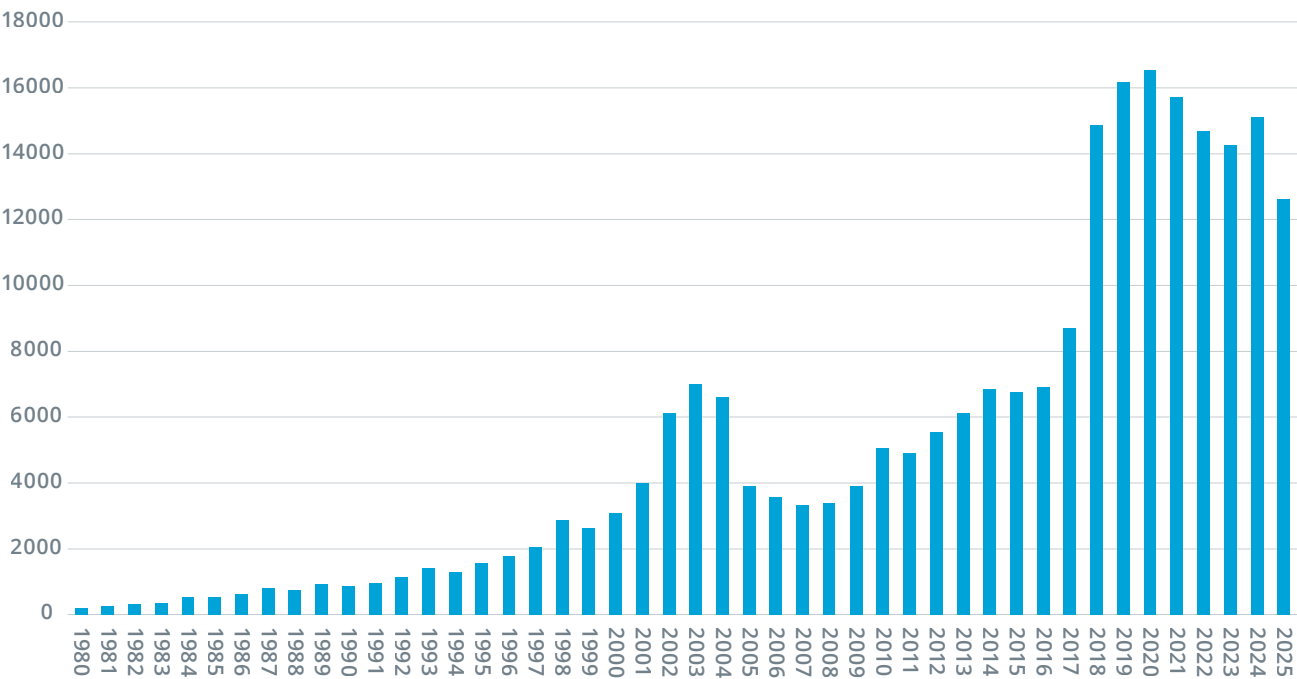
downstream effects help explain why relatively modest investments in university research can generate trillions of dollars in economic activity over time.

The Bayh-Dole Act led to a 70x increase in the annual total of patents on inventions that benefited from government funding since 1980.

The Bayh-Dole Act fundamentally changed how federally funded research is translated into innovation. By allowing nonprofit organizations, including universities, federal laboratories, and small businesses, to patent and license inventions benefiting from federal research funding, the law created strong incentives to develop new technologies, patent them, and bring them to market.

The impact of this change has never been more evident than today. Since 1980, the annual number of patents on inventions that were supported by government funding has increased **more than 70-fold**.

FIGURE 2
Patents on U.S. Inventions Benefiting from Government Funding By Year, 1980-2025



Note. Clarivate World of Science, sample size (N) = 237,368.

In part, this growth reflects the dramatic expansion of America’s research pipeline, driven largely by increased federal research spending. But it also demonstrates the effectiveness of strong intellectual property protections. Secure patent rights encourage researchers and institutions to invest in research and development, identify promising discoveries, and partner with the private sector to bring innovations to market. Patents

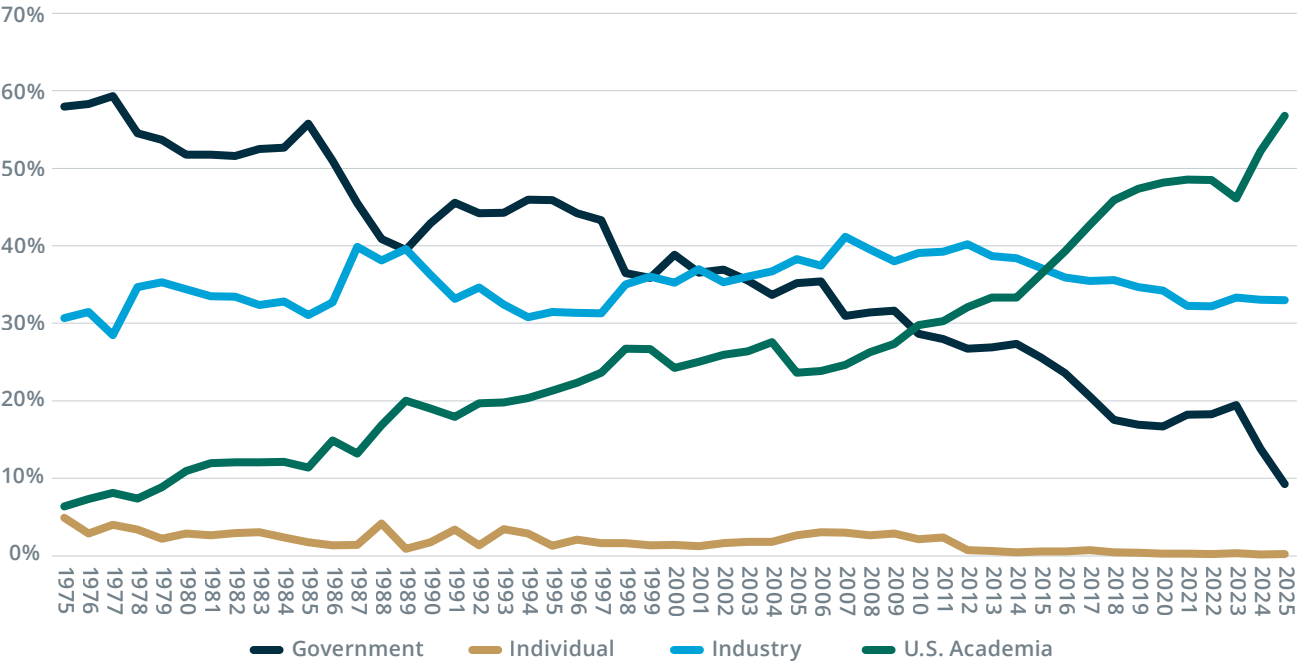
also provide companies with the confidence to invest the significant time and capital required to transform early-stage discoveries into new products and technologies that benefit the public.

Academic institutions own approximately 60% of patents on inventions that benefit from federally funded research.

The Bayh-Dole Act fundamentally reshaped the ownership and management of inventions benefiting from federally funded research. In 1975, before Bayh-Dole, the federal government owned 58% of the 1,084 patents benefiting from federal funding. By contrast, academic institutions own approximately **60% of the 12,786 patents** issued in 2025 for inventions benefiting from federal funding, while the federal government owns just 9%.

Over time, industry’s share of patents benefiting from federal funding has remained relatively stable at around 30% to 40%, and individuals have consistently held less than 10%.

FIGURE 3
Share of Patents on Inventions Benefiting from Government Funding By Originator (1975-2025)



Note. Clarivate World of Science, N = 237,368.

Because universities and other research institutions are primarily responsible for new scientific discoveries, they are often best positioned to identify commercial partners, negotiate licenses, and support the development of new technologies. By placing the responsibility for managing inventions supported by federal funding in the hands of

these institutions, rather than concentrating it within the federal government, Bayh-Dole has fostered a more active and effective system for moving innovations from the laboratory to the marketplace.

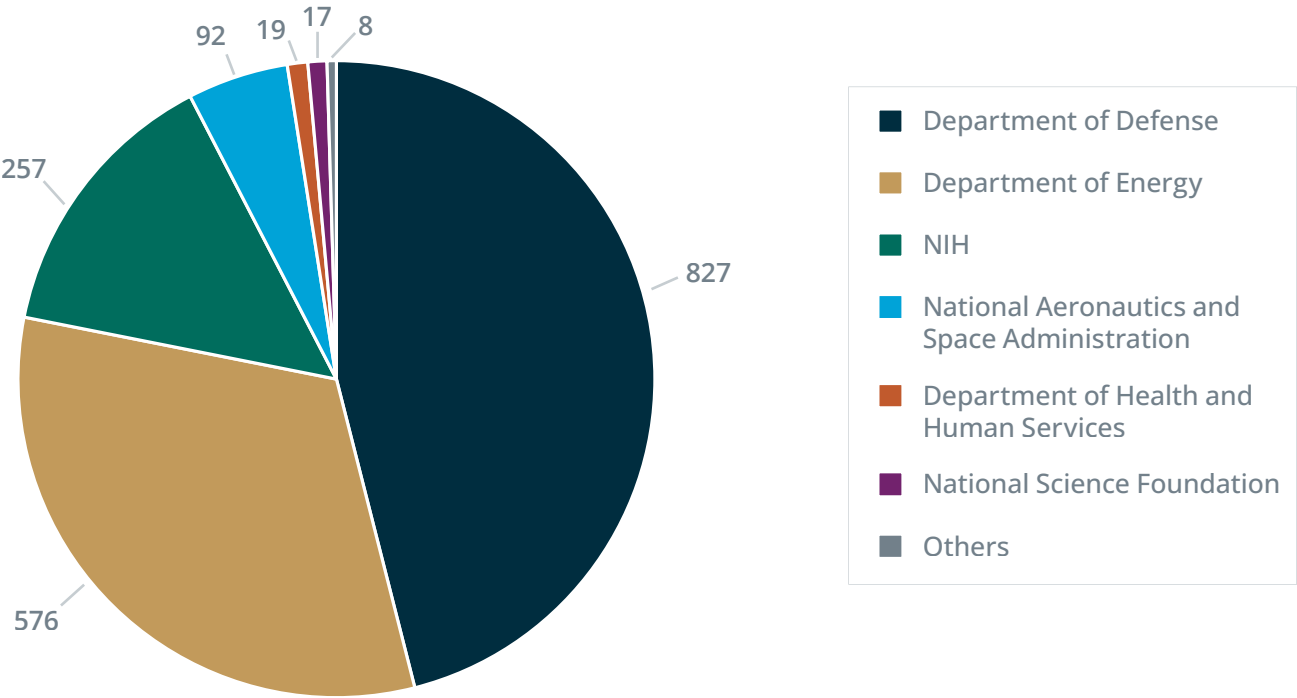
The Bayh-Dole system supports innovation across the federal research enterprise.

Between 2000 and 2024, federal agencies invested nearly **\$1.8 trillion** in research that generated more than **155,000 patents** on inventions benefiting from federally funded research.

The **Department of Defense** accounted for the largest investment (**\$827 billion**), followed by the **Department of Energy** (**\$576 billion**) and the **National Institutes of Health** (**\$257 billion**). Together, these investments span sectors including national security, healthcare, energy, agriculture, transportation, space, engineering, and basic science, demonstrating the broad reach of the Bayh-Dole framework.

The **National Institutes of Health** generated the largest number of patents (**74,578 patents**), followed by the **Department of Defense** (**27,601 patents**) and the **Department of Energy** (**26,509 patents**).

FIGURE 4
Largest Federal Sponsors of Research Generating Inventions Governed by Bayh-Dole (2000-2024)



Note. Numbers reflect \$U.S. Billion (2024).

FIGURE 5***Patents on Inventions Benefiting from Government Funding by Federal Agency (2000-2024)***

Agency	Bayh-Dole Patents
National Institutes of Health	74,578
Department of Defense	27,601
Department of Energy	26,509
National Science Foundation	18,296
Department of Health and Human Services	3,475
National Aeronautics and Space Administration	1,930
Department of Agriculture	1,124
Department of Commerce	664
Department of Homeland Security	323
Department of Transportation	291
Department of the Interior	259
Environmental Protection Agency	100
Department of Justice	93
Department of Education	59
Agency for International Development	44
General Services Administration	39
Department of the Treasury	30
Nuclear Regulatory Commission	22
Department of Veterans Affairs	12
Department of Housing and Urban Development	5
Department of State	4
Institute of Museum and Library Services	1
National Endowment for the Humanities	1

As Figures 4 and 5 illustrate, the Bayh-Dole framework's impact has not been limited to biomedical research. Federal investments have contributed to patented inventions in defense, energy, healthcare, agriculture, transportation, aerospace, environmental protection, and advanced manufacturing, among other industries. Put simply, technology transfer is a government-wide enterprise that supports both broad economic growth and agencies' mission-specific objectives.

The number of university and HRI licenses generating income has expanded across the United States and approximately doubled since the early 2000s.

From 2021 through 2025, universities and HRIs inked an average of **19,387 income-generating licenses** each year — approximately twice the annual average from 2001 through 2005. This growth reflects a substantial expansion in the number of patented technologies benefiting from federal funding moving from research institutions into commercial development.

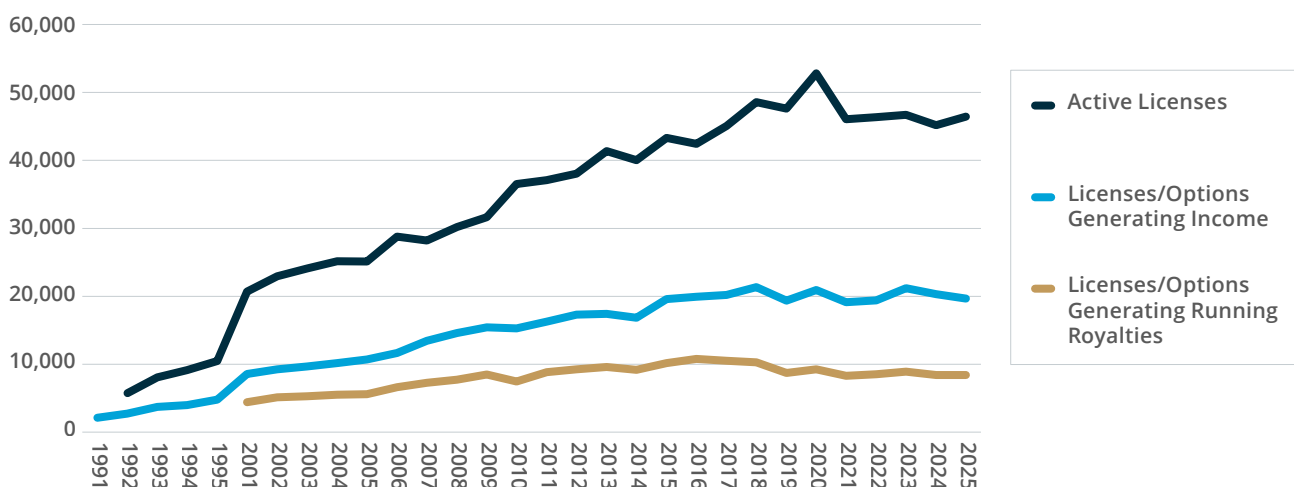
Although many licensed technologies have not yet reached the marketplace, the sustained growth in licensing agreements reflects an expanding portfolio of patented technologies benefiting from federal funding being developed by commercial partners across the country.

The active portfolio of university and HRI licenses continues to grow.

The number of active university and HRI licenses has grown steadily over time, reflecting an expanding pipeline of technologies under commercial development.

FIGURE 6

University and HRI Licenses Over Time: Active, Active Generating Income, and Active Generating Running Royalties



At the same time, Figure 6 demonstrates how only a portion of university and nonprofit licenses generate income, and even fewer generate running royalty revenue. That gap illustrates an important reality of technology commercialization: licensing an invention is only the beginning of the journey to market. Many licensed technologies are still early-stage discoveries that require substantial additional research and development, investment, testing, regulatory work, and other resources before they can become commercially viable products. As a result, only a portion of active licenses generate income in any given year, and an even smaller share generate running royalties from successful product sales. The graph underscores both the risk inherent in technology commercialization and the significant additional investment required to turn promising university research into products that reach consumers.

The Impact of Bayh-Dole by State and Territory

Technology transfer generates economic activity in every region of the country. Universities and HRIs are transforming discoveries into new companies, products, and partnerships with industry, strengthening local innovation systems and supporting economic growth.

To complement Vital Transformation's data on gross licensing income and running royalty income in each state from 2021-2025, the Bayh-Dole Coalition also compiled state data from the AUTM Licensing Activity Survey on products commercialized and startups launched from universities and HRIs in each state, beginning with the first year of reported data in 2001. Because participation in the AUTM Licensing Activity Survey is voluntary and data is self-reported, several states and territories lack complete data in one or more categories. As such, the state-level figures presented represent conservative estimates of technology transfer activity. However, they still illustrate the broad geographic reach of the Bayh-Dole framework across the United States and Puerto Rico.

Under the Bayh-Dole Act, nonprofit research institutions, like universities, must share licensing royalties with inventors and reinvest the remainder in technology transfer costs, scientific research, and education. This helps sustain future discoveries and powers a cycle of continued innovation.



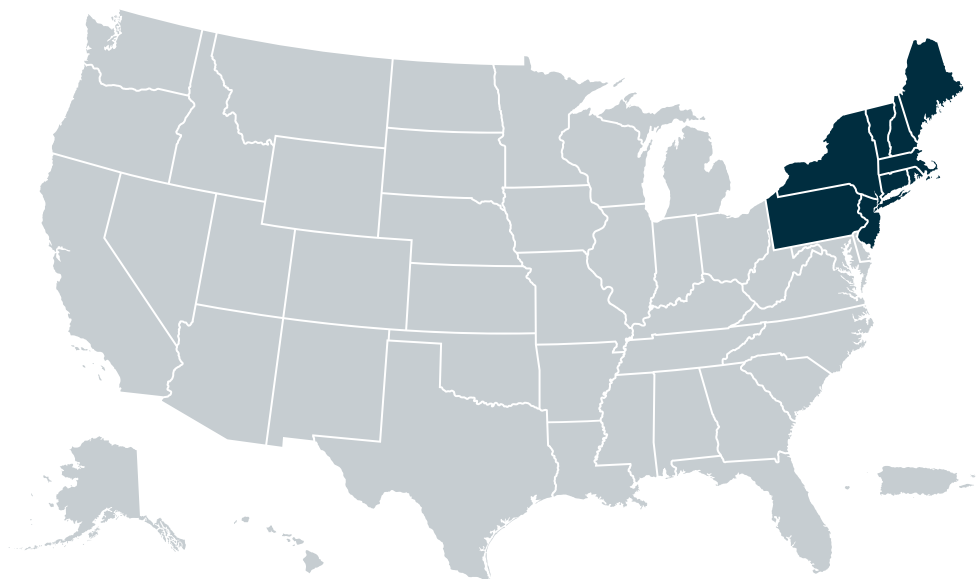
Northeast

The Northeast is home to many of the nation's oldest and most research-intensive universities, making it one of the country's leading regions for technology transfer. Collectively, institutions across the region generated approximately **\$8 billion** in gross licensing income and **\$4.2 billion** in running royalty income from 2021-2025. They also helped launch **4,823 startups** and introduced **2,331 new products** benefiting from federally funded research from 2001-2025. Pennsylvania, Massachusetts, New York, and New Hampshire rank among the nation's strongest performers, demonstrating the region's longstanding leadership in research commercialization.

The Bayh-Dole framework has helped establish the Northeast as a global center for industries such as biotechnology, pharmaceuticals, advanced healthcare, artificial intelligence, robotics, and financial technology. Notable innovations benefiting from federal funding emerging from the region's research institutions include the HIV/AIDS therapy Zerit from Yale University, high-definition video and audio technologies from Columbia University, and mRNA and CAR T-cell technologies from the University of Pennsylvania.

NORTHEAST INCLUDES:

- Connecticut
- Maine
- Massachusetts
- New Hampshire
- New Jersey
- New York
- Pennsylvania
- Rhode Island
- Vermont



5-YEAR DATA FROM 2021-2025



\$8 BILLION
in gross
licensing income

25-YEAR DATA FROM 2001-2025



4,823
startups
launched



2,331
new products
introduced

Source: AUTM (2025). U.S. Licensing Activity Survey, 2001-2025. Note: Numbers are rounded.

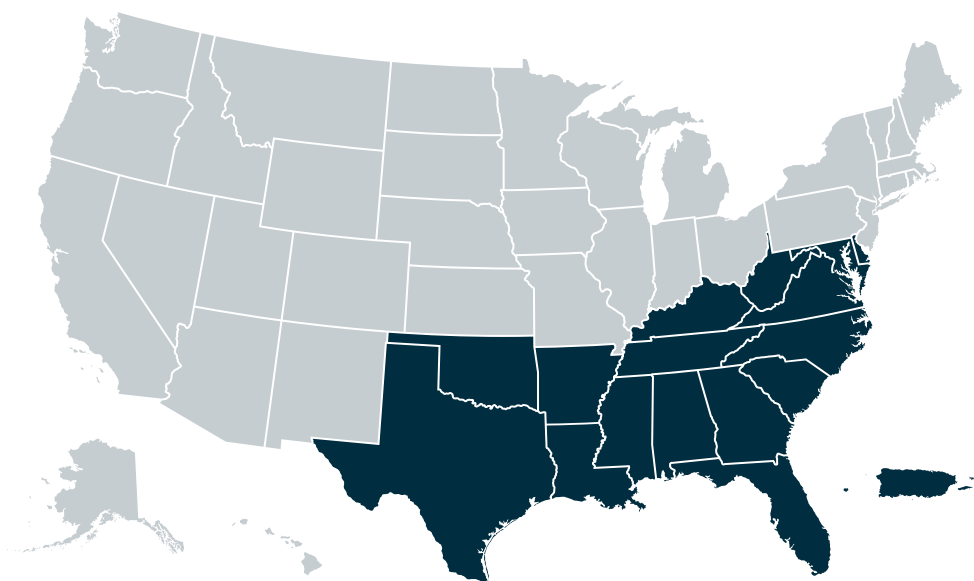
South and Puerto Rico

Universities and nonprofit research institutions across the South and Puerto Rico continue to translate discoveries that benefited from federal funding into economic growth. Together, institutions in the region generated approximately **\$3.4 billion** in gross licensing income and **\$2.6 billion** in running royalty income from 2021-2025, while helping create **5,482 startups** and introducing **4,772 new products** from 2001-2025. States including Texas, Georgia, North Carolina, Florida, Maryland, and Tennessee demonstrate the growing strength of the South's research and commercialization system.

The Bayh-Dole framework has supported the expansion of industries including life sciences, aerospace, defense, agricultural technology, advanced manufacturing, energy, and cybersecurity throughout the region. This sector-spanning impact is reflected in patented technologies that benefited from federal funding including Epivir, an HIV/AIDS therapy from Emory University; Tovaxin, a customized multiple sclerosis therapy from Baylor College of Medicine; a Louisiana State University vaccine protecting cattle against bovine respiratory disease; and counterfeit credit card detection technology from the University of Florida.

SOUTH INCLUDES:

- Alabama
- Arkansas
- Delaware
- District of Columbia
- Florida
- Georgia
- Kentucky
- Louisiana
- Maryland
- Mississippi
- North Carolina
- Oklahoma
- Puerto Rico
- South Carolina
- Tennessee
- Texas
- Virginia
- West Virginia



5-YEAR DATA FROM 2021-2025



\$3.4 BILLION
in gross
licensing income

25-YEAR DATA FROM 2001-2025



5,482
startups
launched



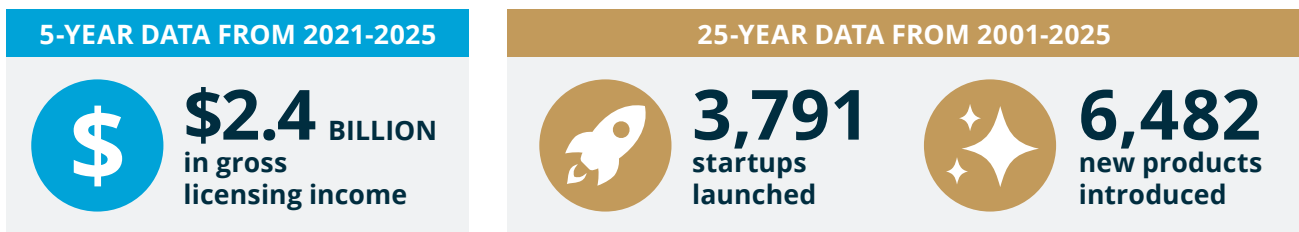
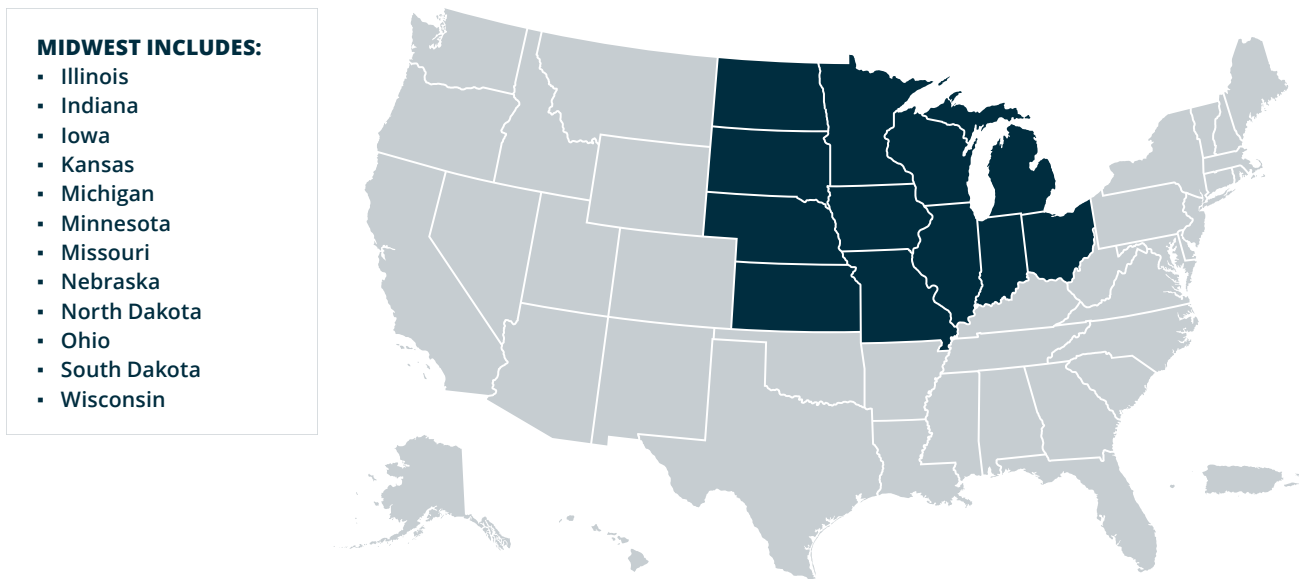
4,772
new products
introduced

Source: AUTM (2025). U.S. Licensing Activity Survey. 2001-2025. Note: Numbers are rounded.

Midwest

The Midwest has long been recognized as a center for engineering, manufacturing, and agricultural innovation. From 2021-2025, institutions throughout the region generated approximately **\$2.4 billion** in gross licensing income and **\$1.3 billion** in running royalty income — while launching **3,791 startups** and introducing **6,482 new products** from 2001-2025. Minnesota, Ohio, Illinois, Indiana, Missouri, and Michigan represent some of the region’s largest contributors to technology transfer activity.

The Bayh-Dole framework has helped strengthen Midwest industries such as advanced manufacturing, medical devices, agricultural technology, automotive innovation, industrial engineering, and materials science. Midwest institutions are behind patented innovations that benefited from federal funding such as Lyrica, developed from research at Northwestern University to treat neuropathic pain and epilepsy; a pocket-sized personal electrocardiograph from the Purdue Research Foundation; FluMist from the University of Michigan; a diagnostic test for cystic fibrosis and HPV developed from University of Wisconsin-Madison research; and firefighting drone technology from the University of Nebraska-Lincoln.



Source: AUTM (2025). U.S. Licensing Activity Survey. 2001-2025. Note: Numbers are rounded.

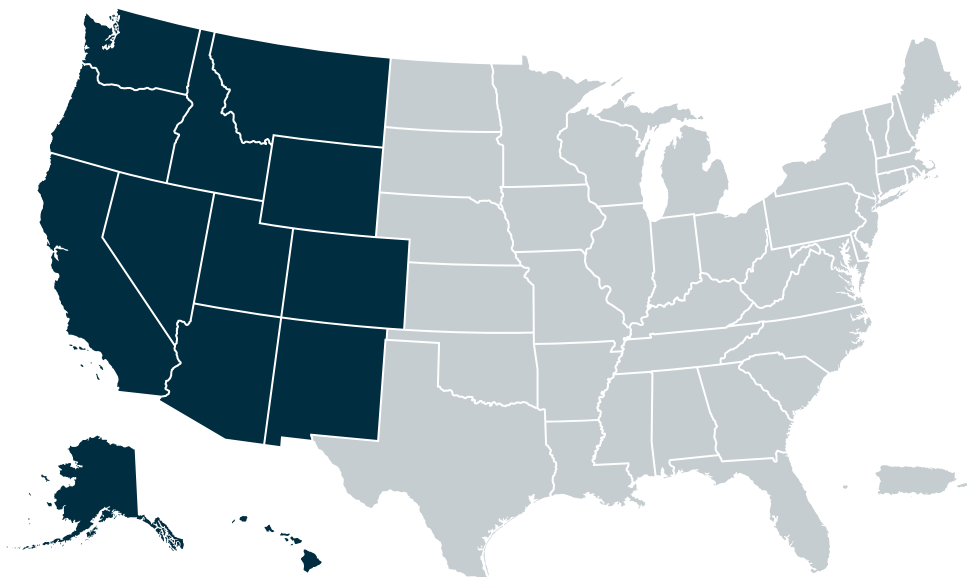
West

The West combines world-leading research universities with a dynamic entrepreneurial ecosystem that has made the region a global leader in innovation. Collectively, western institutions generated approximately **\$2.4 billion** in gross licensing income and **\$1.1 billion** in running royalty income from 2021-2025 while supporting **4,931 startups** and bringing **3,667 new products** to market from 2001-2025. California, Washington, Utah, Colorado, Arizona, and Oregon account for much of the region's commercialization activity, reflecting the concentration of major research institutions and technology companies.

In the West, the Bayh-Dole framework has played a significant role in advancing industries such as software, semiconductors, biotechnology, clean energy, aerospace, artificial intelligence, quantum technology, and environmental innovation. Stanford University, for example, benefited from federal funding to produce gene-chip technology and Google's groundbreaking search algorithm, while Caltech research led to the "camera-on-a-chip" that enabled the widespread use of cameras in smartphones and countless other applications. The University of Arizona has used federal funding to develop non-lethal pest-control technology, and innovations benefiting from federal funding for the early detection and prevention of osteoporosis began in University of Washington labs.

WEST INCLUDES:

- Alaska
- Arizona
- California
- Colorado
- Hawaii
- Idaho
- Montana
- Nevada
- New Mexico
- Oregon
- Utah
- Washington
- Wyoming



5-YEAR DATA FROM 2021-2025

 **\$2.4** BILLION
in gross
licensing income

25-YEAR DATA FROM 2001-2025

 **4,931**
startups
launched

 **3,667**
new products
introduced

Source: AUTM (2025). U.S. Licensing Activity Survey, 2001-2025. Note: Numbers are rounded.

State-by-State and Territory Technology Transfer Activity

State/Territory	25-YEAR DATA FROM 2001-2025		5-YEAR DATA FROM 2021-2025	
	Products Commercialized (2001-2025)	Start-Ups Initiated (2001-2025)	Gross Licensing Income 2021-25 (2025 \$U.S.)	Running Royalty Income 2021-25 (2025 \$U.S.)
Alabama	83	169	\$8,242,690	\$3,703,092
Alaska	5	7	Not Reported	Not Reported
Arizona	112	504	\$61,087,708	\$42,528,407
Arkansas	102	107	\$25,665,616	\$23,875,759
California	1738	2488	\$1,477,776,125	\$577,562,657
Colorado	200	468	\$85,897,408	\$57,935,059
Connecticut	35	158	\$81,967,869	\$35,599,197
Delaware	17	46	\$16,307,260	\$13,556,985
District of Columbia	17	61	\$10,718,298	\$4,120,751
Florida	591	741	\$314,651,785	\$194,950,164
Georgia	1137	482	\$654,610,165	\$597,636,491
Hawaii	6	35	\$1,463,680	\$909,656
Idaho	49	23	\$8,487,590	\$8,354,582
Illinois	443	607	\$372,965,430	\$244,045,208
Indiana	247	517	\$210,339,809	\$164,052,106
Iowa	392	180	\$31,037,993	\$25,288,987
Kansas	103	98	\$52,364,950	\$22,860,489
Kentucky	18	193	\$16,442,672	\$7,853,249
Louisiana	64	152	\$28,035,092	\$23,186,530
Maine	3	15	\$1,284,632	\$1,281,882
Maryland	472	608	\$285,793,918	\$161,544,048
Massachusetts	731	1762	\$1,977,240,863	\$923,787,884
Michigan	612	528	\$169,786,203	\$92,451,456
Minnesota	2458	491	\$732,790,798	\$389,037,555

Mississippi	35	78	\$1,354,455	\$741,988
Missouri	210	210	\$188,729,851	\$37,256,048
Montana	59	45	\$3,026,457	\$2,703,358
Nebraska	141	139	\$35,575,915	\$29,912,484
Nevada	16	28	\$2,038,951	\$1,573,132
New Hampshire	114	45	\$342,230,763	\$306,739,242
New Jersey	146	261	\$145,292,781	\$106,581,171
New Mexico	33	178	\$75,390,272	\$1,391,378
New York	621	1385	\$911,124,356	\$516,550,704
North Carolina	774	808	\$641,128,386	\$417,773,051
North Dakota	146	12	\$2,383,813	\$2,367,414
Ohio	496	762	\$471,310,594	\$267,965,350
Oklahoma	73	104	\$18,715,894	\$16,526,084
Oregon	300	220	\$96,994,152	\$28,509,056
Pennsylvania	626	1100	\$4,491,757,559	\$2,299,983,350
Puerto Rico	4	7	Not Reported	Not Reported
Rhode Island	41	42	\$8,362,475	\$7,824,375
South Carolina	114	214	\$9,760,382	\$6,746,367
South Dakota	5	12	\$1,033,293	\$954,619
Tennessee	328	198	\$375,854,351	\$242,661,752
Texas	741	1101	\$904,979,197	\$876,264,472
Utah	328	539	\$240,338,587	\$205,193,106
Vermont	14	55	\$1,240,586	\$409,580
Virginia	189	391	\$55,492,135	\$28,153,200
Washington	821	394	\$330,704,014	\$156,054,053
West Virginia	13	22	\$1,143,405	\$81,006
Wisconsin	1229	235	\$101,968,981	\$50,255,331
Wyoming	Not Reported	2	\$198,846	\$133,562

Note: Products Commercialized and Startups initiated data cover 2001-2025. Gross Licensing Income and Running Royalty Income data cover 2021-2025.

Source: AUTM Licensing Activity Survey, July 2025

Conclusion

For over four decades, the Bayh-Dole Act has helped ensure federally funded research does not end with scientific discovery, but continues through commercialization to create products, companies, jobs, and industries that benefit the American public. The law helped make the United States a worldwide leader in innovation, not through government micromanagement, but by enabling the institutions behind inventions benefiting from government funded research to manage them effectively. Even more importantly, the Bayh-Dole framework incentivizes the private sector to invest the significant amounts of [time and money](#) needed to turn a patented discovery supported by federal funding into a useful product.

This report demonstrates that the economic returns from that system have been substantial. Between 1996 and 2025, technology transfer associated with discoveries that benefited from federal funding generated trillions of dollars in economic activity, supported millions of job-years, and dramatically expanded the commercialization of patented inventions that benefited from government funding. The benefits span the federal research enterprise — from healthcare and agriculture to defense and energy — and continue to strengthen regional economies, attract private investment, and reinforce U.S. industrial competitiveness.

As policymakers consider how best to protect and promote American innovation, these findings are an important reminder of the benefits the Bayh-Dole framework has delivered for the American people. It has demonstrated that enabling academic institutions, nonprofit organizations, small businesses, and federal laboratories to own and manage inventions made with federal support is an effective way to maximize returns on federal research investments and transform discoveries supported by taxpayer dollars into widespread economic and societal value. It has also given the United States a distinct competitive advantage by empowering small companies — many spun out of university research — to drive technological and economic growth. This model has proven to be far more effective than the previous system where Washington managed technology transfer.

America's innovation leadership depends not only on world-class research, but also on a commercialization system capable of moving discoveries from the laboratory to the marketplace efficiently and effectively. The evidence presented in this report shows that the Bayh-Dole framework continues to fulfill that role, making it one of the nation's most successful innovation policies in history. Protecting and strengthening this system will help ensure that technologies benefiting from federally funded research continue to deliver lasting economic and societal benefits for generations to come. In short, Bayh-Dole works.

Acknowledgments

The Bayh-Dole Coalition's *Economic Impact of the Bayh-Dole Act* report is based on data from AUTM's voluntary licensing survey as analyzed by Vital Transformation.

About the Bayh-Dole Coalition

The Bayh-Dole Coalition is a group of innovation-oriented organizations and individuals committed to celebrating and protecting the Bayh-Dole Act, as well as informing policymakers and the public of its many benefits.



About Vital Transformation

Vital Transformation is an independent research and consulting firm that evaluates the impact of healthcare innovation, technology, and public policy. By combining economic analysis with subject matter expertise, Vital Transformation helps policymakers and stakeholders understand how research, innovation, and technology transfer contribute to improved health outcomes, economic growth, and societal benefit.



About AUTM

AUTM is the nonprofit leader in efforts to educate, promote and inspire professionals to support the development of academic research that changes the world and drives innovation forward. Our community comprises more than 3,000 members who work in more than 800 universities, research centers, hospitals, businesses and government organizations around the globe. The Bayh-Dole Coalition thanks AUTM for its assistance, which made this report possible.



About the “Economic Contributions of University/Nonprofit Inventions in the United States: 1996–2020” Report

The 2022 report *Economic Contributions of University/Nonprofit Inventions in the United States: 1996–2020* — prepared for the Biotechnology Innovation Organization (BIO) and AUTM by Lori Pressman, Mark Planting, Carol Moylan and Jennifer Bond — examined the economic impact of licensing and commercializing inventions developed at U.S. universities and nonprofit research institutions. This report builds on that analysis, applying the same methodology and incorporating five additional years of data to provide an updated picture of the economic contributions of university and nonprofit technology transfer through 2025.

Appendix: Methods and Data

Methodology

We replicated exactly the I/O methods used in the June 14, 2022, BIO/AUTM-funded report: “Economic Contributions of University/Nonprofit Inventions in the United States: 1996-2020.”

The I/O method multiplies a change in the value of an industry’s final sales times a “multiplier” to estimate the change in an industry’s gross output required to deliver the specified value of final sales. Corresponding GDP and employment multipliers are then applied, respectively, to the gross output change to estimate contributions to GDP and employment.

Licensors’ running royalty income (RRI) in each year is divided by an assumed royalty rate (either 2% or 5%) to estimate licensees’ final sales.

- As in the 2022 BIO/AUTM report, the ultimate commercializers (“licensees”) of University IP are assumed to be firms in the following U.S. industries (w/ NAICS code): chemical products (325), computer and electronic products (334), motor vehicles, bodies and trailers, and parts (3361MV), other transportation equipment (3364OT), publishing industries, except internet (includes software) (511), miscellaneous professional, scientific, and technical services (5412OP), and computer systems design and related services (5415).
- The ultimate commercializers (“licensees”) of HRI IP are assumed to be firms in chemical products (325) and miscellaneous professional, scientific, and technical services (5412OP). See the BIO/AUTM report for citations supporting this choice of industries as the ultimate commercializers of University and HRI IP.

Given licensor income and estimated ultimate commercializer (licensee) sales from 1996–2020, the BIO/AUTM report then applied GDP, employment and gross output multipliers sourced from the Bureau of Economic Analysis (BEA). Since the analysis targets impacts arising only from U.S. domestic production, the BIO/AUTM report assumed that only a fraction of total licensee sales in each year were derived from products produced in the U.S. The fraction of licensee sales derived from U.S.-based production when licensees are “All MNE” is smaller than when licensees are deemed “Half MNE.”

For 1996-2020, the BIO/AUTM report listed its data on gross licensor income and running royalties (Table S-8) and reported gross output, value-added and employment multipliers (Table S-9).

We extracted AUTM survey data on gross licensor income and running royalties for 1996-2025 and appended our 2021-2025 data to that reported in the BIO/AUTM report for 1996-2020.

We use the same formulas for calculating contributions to U.S. GDP, gross output, and employment reported in the BIO/AUTM report (see below). However, the BIO/AUTM report did not report values for all variables appearing in these equations. Specifically, values for “(the additional share of domestically produced sales attributable to domestic final demand).” We therefore imputed the value of this variable as part of calibrating each equation to reproduce the contribution values reported in the BIO/AUTM report.

For the period 2021-2025, the values of variables used in the estimating equations were derived as follows:

- Multipliers for value added and gross output were derived in each year using the corresponding BEA domestic Make, Use, Market Share, and Import tables to derive the associated or “industry-by-industry domestic requirements matrix” using the methods described in <https://apps.bea.gov/industry/pdf/DomesticRequirementsDerivation.pdf> (see equation 10).
- Values for “the additional share of domestically produced sales attributable to domestic final demand” in each year were computed using the Bureau of Economic Analysis’ (BEA) annual Make, Use, Market Share, and Import tables to derive the share of an industry’s domestic sales attributable to domestic final demand.

We report our results for monetary values measured either in 2012 U.S. dollars (as in the BIO/AUTM report) or in 2025 U.S. dollars.

For further details on the methodology and assumptions, please see the BIO/AUTM report “Economic Contributions of University/Nonprofit Inventions in the United States: 1996–2020.”

Equations for Estimating Contributions to U.S. GDP, Gross Output and Employment

The following reproduces the formulas used in the 2022 BIO/AUTM report (p. 18) to compute the contribution of University and HRI licensing to U.S. GDP, employment and gross output.

GDP: AGDP: a part due to license income received by the licensors + BGDP: a part due to licensed product sales by licensees.

- $AGDP = (\text{license income received}) / (\text{GDP price})$
- $BGDP = [((\text{modeled domestically produced licensee sales}) \times (\text{value-added ratio from U.S. I-O table})) + (\text{additional share of domestically produced sales attributable to final demand}) \times (\text{domestic value-added multiplier})] / (\text{GDP price})$

Employment supported by final purchases associated with AUTM Survey respondent licensing:

- AYES: portion associated with license income of AUTM licensors + BYES: portion associated with licensed product sales by licensees.
- $AYES = (\text{licensor employment to output ratio}) \times (\text{licensor income received})$
- $BYES = ((\text{modeled domestically produced licensee sales}) \times (\text{employment to output ratio for research intensive industries}))$
- $+ (\text{additional share of domestically produced sales attributable to final demand}) \times (\text{employment to output for research intensive industries})$

Gross Industry Output: AGO : a part due to license income + licensor income received

- BGO : a portion associated with licensed product sales by licensees.
- AGO comprises two parts, A1GO + A2GO. A1GO is effect of license income received by licensors; A2GO is effect outside the licensor when licensor spends that income.
 - » $A1GO = (\text{license income received}) / (\text{GDP price})$
 - » $A2GO = ((\text{license income received}) \times (\text{domestic NAICS 61 output multiplier})) / (\text{GDP price})$
 - » $BGO = ((\text{modeled domestically produced licensee sales}) + (\text{additional share of domestically produced sales attributable to domestic final demand})) \times (\text{domestic output multiplier}) / (\text{GDP price})$

Allowance for Non-U.S. Production by Multinational Enterprises (MNEs) Licensees

We used the BIO/AUTM report's "Domestic Production Factor" adjustment to account for licensee production outside the U.S. This adjustment reflects that licensee firms in the modeled research-intensive industries are often large MNEs with foreign-based production. Below reproduces the BIO/AUTM report's Table A-4 (p. 35) – as updated for 2021-2025 - showing the estimated fraction of licensee sales deemed to derive from products produced in the U.S. when licensees are either "All MNE" or "Half MNE" and licensors are either Universities or HRIs.

Combined University and HRI Contribution to GDP, Employment and Gross Output, 1996-2025 (Values in 2012 \$U.S.)

"Half MNE" assumes approximately one-half of downstream licensees are multinational enterprises, while "All MNE" assumes all downstream licensees are multinational enterprises. Downstream impacts arise from sales of commercialized products produced domestically. "All licensees are MNE" assumes, on average, roughly 58% of licensee

products are domestically produced. “One-half of licensees are MNE” assumes, on average, roughly 79% of licensee products are domestically produced. The “Half MNE” results therefore exceed those for “All MNE.” Impacts are larger at smaller earned royalty rates since licensee product sales in each year are estimated as: licensee product sales = (licensor running royalties)/(earned royalty rate) and licensor running royalty income does not change as the earned royalty rate changes. Ultimate commercializers of University IP are assumed to be firms in the following U.S. industries (w/ NAICS code): chemical products (325), computer and electronic products (334), motor vehicles, bodies and trailers, and parts (3361MV), other transportation equipment (3364OT), publishing industries, except internet (includes software) (511), miscellaneous professional, scientific, and technical services (5412OP), and computer systems design and related services (5415). Ultimate commercializers of HRI IP are assumed to be firms in chemical products (325) and miscellaneous professional, scientific, and technical services (5412OP).

Data Samples Used in Analysis

To extend the BIO/AUTM report’s analysis beyond 2020, VT extracted from AUTM’s STATT database all available data on the same variables used in the BIO/AUTM report. Our data sample comprises all AUTM data comprising the cohort “U.S. - Across All Years (n=342).” These data were then filtered to include only survey respondents whose “institution type” was either “U.S. Universities” or “U.S. Hospitals and Research Institutes.” The result was an unbalanced sample comprising 5,009 entity-year observations, of which 4,083 are university-years of observations and 926 are Hospital and Research Institute-years of observations.

The BIO/AUTM study did not list the members of its data cohort, but it did discuss some filtering of the complete AUTM survey data sample. As such, our data sample may not exactly match that used in the 2022 BIO/AUTM report.

To keep our analysis as close as possible to that of the BIO/AUTM report, we used the reported BIO/AUTM data on gross license income and running royalties from 1996 to 2020 and appended to these data the AUTM survey data on these variables (defined, respectively, by AUTM survey variables “*\$ Gross License Income received [LIRECD]*” and “*\$ License Income: Running Royalties [LIRUNR]*”) for the years 2021- 2025. Data on the number of licenses, etc., shown in this report either in table or graph format, we instead used our dataset for the years 1996-2025 (since data on such variables were not reported in the BIO/AUTM report). The AUTM survey reports these latter data as variables # *Count Licenses/Options: Generating License Income [LCGNLI]* and # *Count Licenses/Options: Running Royalties [LCGNRR]*.

The figures report on the degree of match between our AUTM data sample and that used in the BIO/AUTM report over common time periods (generally 1996-2020).

As shown in these figures, our data sample exhibits a high degree of correlation with that used in the BIO/AUTM report, giving confidence in the use of the variables in our dataset.