

PENNSYLVANIA

The United States leads the world in several science and engineering (S&E) measures. The latest data in the National Science Board's 2024 Science and Engineering Indicators report show that globally the U.S. invests the most in research and development (R&D), attracts the most venture capital, and is the leading producer of service output from knowledge-and technology-intensive industries.

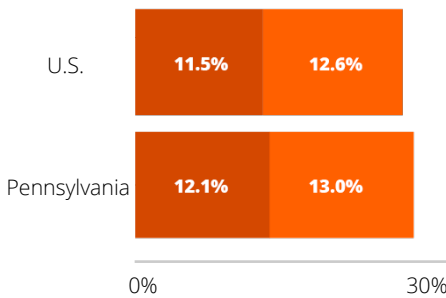
Four benchmarks of Pennsylvania's S&E performance are highlighted here: The economics of the Skilled Technical Workforce, the cost and economic benefit of a bachelor's degree, investment in state R&D, and state venture capital investment levels.

Economics of the Skilled Technical Workforce

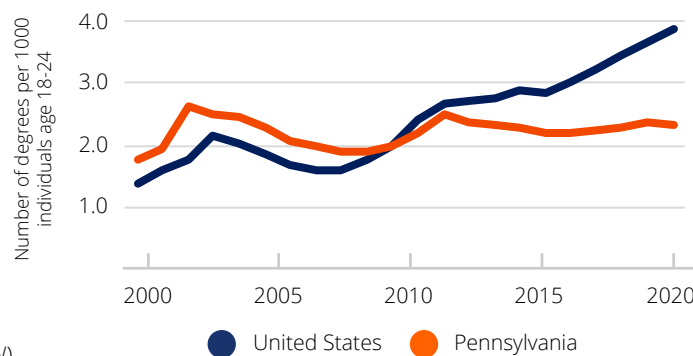
The Skilled Technical Workforce (STW) includes workers whose jobs require significant science, technology, engineering, and math (STEM) knowledge and expertise and who do not have a bachelor's degree. Associates degrees in science and engineering are one of the many pathways into the STW and open up opportunities for higher-paying jobs.

Nationally, the STW makes up 52% of the nation's STEM workforce. These workers fill critical roles in the economy, from welding and fabrication to cybersecurity and healthcare.

Jobs in STEM as a Percent of All Jobs



Associate's Degrees in S&E



Median Wages for Workers without Bachelor's Degrees (PA)

STEM Occupations
\$55,000

All Occupations
\$44,000

Source: U.S. Census Bureau, American Community Survey (ACS), 2021, Public Use Microdata (PUMS) data as of October 2022; National Center for Education Statistics, Integrated Postsecondary Education Data System (various years), U.S. Census Bureau, 2000 and 2010 Decennial Censuses and Population Estimates Program (various years), data available as of September 2022.

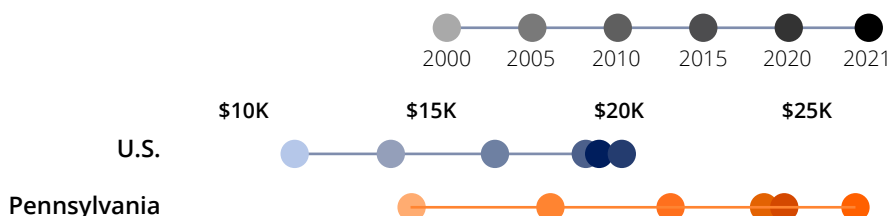
The Cost and Benefit of a Bachelor's Degree

A STEM bachelor's degree can provide a substantial return on investment and is one of several entry points to higher paying jobs associated with science, engineering, and many technical occupations.

Nationally, 39% of the total U.S. workforce has a bachelor's degree or higher, but that rises to 48% in the STEM workforce.

Average Annual In-State Cost of a Public 4-Year Institution

(Adjusted for inflation to constant 2017 dollars)



Median Wages for Workers with Bachelor's Degrees (PA)

STEM Occupations \$85,000

Non-STEM Occupations \$70,000

All Occupations \$75,000

Source: National Center for Education Statistics, Digest of Education; U.S. Census Bureau, American Community Survey (ACS), 2021, Public Use Microdata (PUMS) data as of October 2022

Real Change in Research & Development Performed

R&D spending is a driver of innovation. Investing today in science, engineering, and technology has ripple-effect benefits throughout a state's economy over the long-term.

Annual state performance in R&D varies considerably, from \$347 million (SD) to \$193 billion (CA). Pennsylvania is one of nine states that performs between \$15-\$35 billion per year in R&D. In this figure, Pennsylvania's percent change in R&D spending is shown along with that for the U.S., with the shaded area representing the range of changes for the other nine states performing between \$15-\$35 billion per year in R&D.

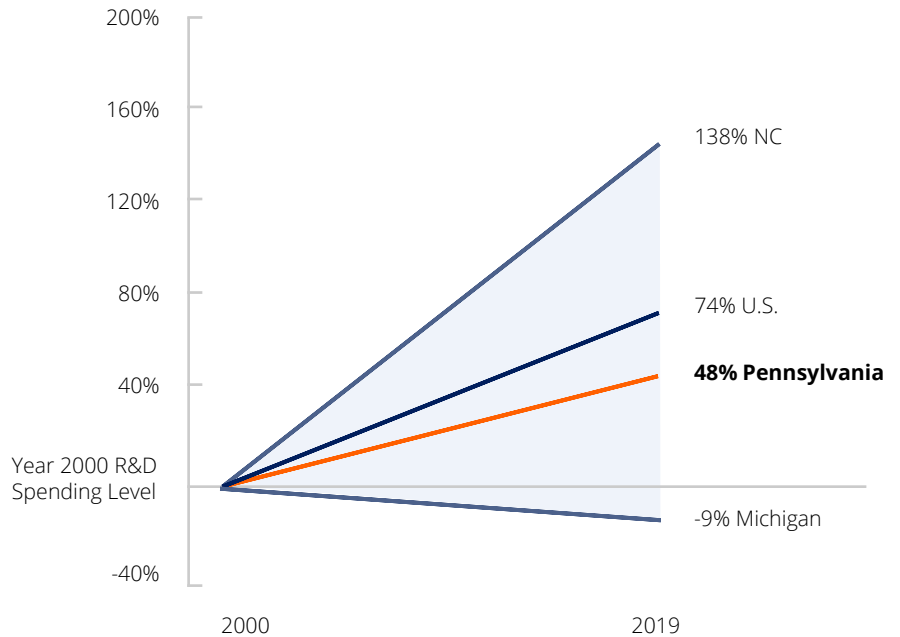
Total 2019 Research and Development Performed

PA **\$20.8 Billion**

U.S. **\$666.2 Billion**

Percent Change in R&D Spending: 2000 to 2019

(Adjusted for inflation to constant 2017 dollars)



Source: National Center for Science and Engineering Statistics, National Patterns of R&D Resources

Venture Capital Investment

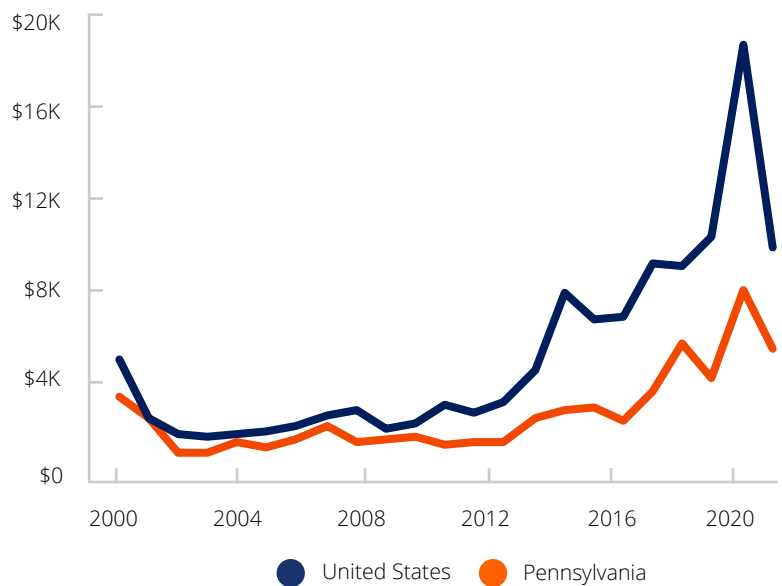
Venture capital investment supports U.S. businesses that take on the risk of developing and commercializing cutting-edge, emerging technologies. States with high values are successful at attracting venture capital to fuel new kinds of business, and ultimately, expand economic growth.

Total 2022 Venture Capital Investment

PA **\$5.0 Billion**

U.S. **\$256 Billion**

Venture Capital per \$1 Million of GDP: 2000 to 2022



Source: PitchBook Venture Capital and Private Equity Database