Building on Virginia's Research and Development Momentum

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Investment into research and development (R&D) is a key driver of innovation and economic growth, so recent changes to Virginia's research and development tax credit come at a good time as the Commonwealth seeks to maintain the momentum that has propelled it to the fore in state business climate. Virginia Governor Glenn Youngkin recently signed legislation that impacts Virginia's major research and development expenses tax credit. The changes include a decreased major R&D expenses cap, a new credit calculation method, and an increased R&D expenses tax credit cap.[1] The purpose of the legislation is to encourage innovation in Virginia by providing enhanced tax incentives to organizations that invest in qualified R&D activities.[2] For many years, the Commonwealth has invested heavily in research and development—both in the public sector and the private sector. But, given the 2020 pandemic recession's impacts on the economy nationwide, how did Virginia's research and development economy fare over that period?

In 2021, research and development activity directly contributed $11.9 billion to the Commonwealth's economic output and supported 121,000 jobs with $10.7 billion in compensation in Virginia, according to the U.S. Bureau of Economic Analysis (BEA). In May 2024, BEA produced experimental statistics measuring the research and development value added contribution to GDP for the nation, all 50 states, and the District of Columbia.[3] The most recent published data describes conditions spanning 2017 to 2021, which provides a useful look at the makeup of Virginia's R&D economy and how it was affected by the pandemic year of 2020.

"Of the fifteen largest state research and development economies, only Washington State's R&D output grew more rapidly than Virginia's from 2017 to 2021."

The BEA data for 2021 shows that the Virginia research and development economy accounted for 1.9 percent of its current-dollar gross domestic product (GDP) in 2021[4], which was a little lower than the 2.3% nationwide. R&D as a share of each state's gross domestic product, or GDP, ranged from 0.3 percent in Louisiana and Wyoming to 6.3 percent in New Mexico, home to federally funded Los Alamos National Laboratory and Sandia National Laboratories. Among nearby states, value added for R&D as a share of state GDP ranged from 0.5 percent in West Virginia to 2.7 percent in Maryland. The share was four percent in the District of Columbia.

At $163.4 billion, California had, by far, the largest R&D sector as it comprised thirty percent of the U.S. total. At $34.3 billion, Washington State trailed in second with 6.3% of the U.S. total. Other top R&D-producing states include Massachusetts, Texas, and New York. Virginia ranked thirteenth with 2.2% of R&D contribution to U.S. GDP. Research and development's share of U.S. value added in 2021 was comparable to large sectors like hospitals (2.4 percent) and food services and drinking places (2.2 percent).

Virginia research and development activity fell outside of the top ten states in size, but, of the top fifteen, only Washington State grew faster from 2017 to 2021. Virginia R&D output rose by 72% over five years from $6.9 billion to $11.9 billion, compared to 44% growth nationwide.

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[1] *"KBKG Tax Alert: Virginia Research and Development Expenses Tax Credits Amended." Ian Williams.* https://www.kbkg.com/research-and-development/virginia-research-and-development-expenses-tax-credits-amended

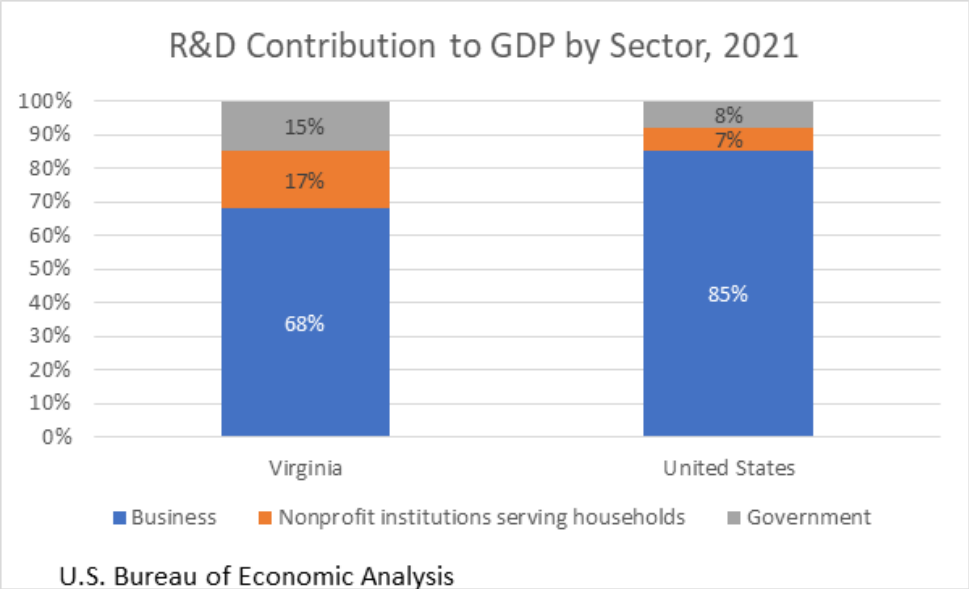
[2] For more information on the research and development tax credit changes, see the Virginia Department of Taxation's 2024 Legislative Summary.

[3] U.S. Department of Commerce, "Bureau of Economic Analysis Research and Development Satellite Account." "Concepts, Data, and Methods for Preparing Experimental National and State-Level R&D Production Statistics". Ledia Guci, Gabriel Medeiros, Dirk van Duym. May 9, 2024.

[4] U.S. Department of Commerce, Bureau of Economic Analysis. *"Experimental R&D Value Added Statistics for the U.S. and States Now Available."* https://www.bea.gov/news/blog/2024-05-09/experimental-rd-value-added-statistics-us-and-states-now-available. May 9, 2024.

Sectors that Drive the Virginia Research and Development Economy

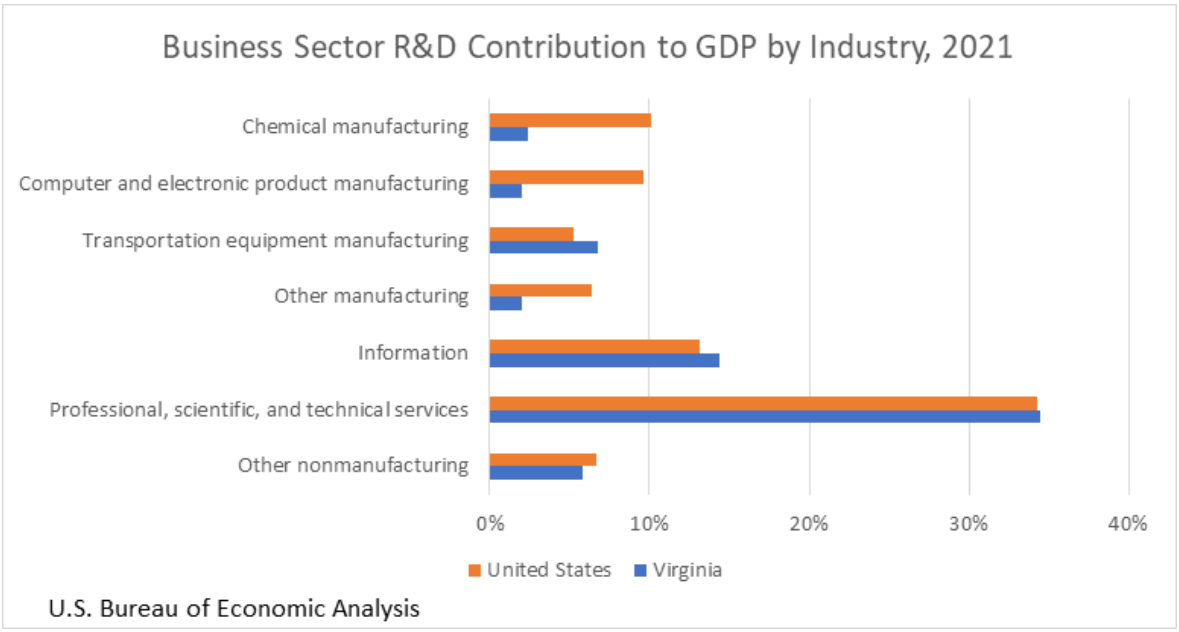
According to the BEA estimates, over two thirds of Virginia R&D output is generated by the business sector, followed by nonprofit institutions serving households (17 percent) and government (15 percent). At 85 percent, the business sector contributed a greater portion to R&D GDP nationwide.



R&D produced by other nonprofit institutions serving households is significant in Virginia, making up 17 percent of R&D compared to seven percent nationwide. Perhaps this represented a shift in resources as government R&D activity in Virginia underperformed compared to national trends. The decline was led by federal government (defense as well as nondefense) but was partially offset by growing activity in state and local government. State and local government includes public college and university output. Virginia private college and university R&D growth underperformed national trends.

In Virginia's private sector, the professional, scientific, and technical services industry accounted for 35 percent of R&D value added and the Information industry accounted for 14 percent. Virginia nonmanufacturing R&D output was up 125 percent from 2017-2021 and was led by the information sector and other nonmanufacturing.

Manufacturing in Virginia is a smaller driver of research and development than nationwide. For example, U.S. chemical manufacturing (ten percent) and computer and electronic product manufacturing (ten percent) account for sizable shares but are smaller in Virginia. However, manufacturing R&D output in Virginia nearly doubled from 2017 to 2021, led by chemical manufacturing and other manufacturing.



Virginia Research and Development Employment

This Virginia research and development output supported an estimated 121,100 jobs in 2021. This was a 48 percent increase from 82,100 workers in 2017. The growth was centered in the nonmanufacturing business sector, which rose nearly 130 percent over five years to 44,600 jobs. Other nonprofit institutions—excluding universities and colleges—rose by 69 percent to 43,000. Federal government R&D employment fell by 38 percent to 12,900 jobs. Public and private nonprofit universities and colleges supported 13,400 research and development jobs, up 13 percent over five years.

What Funding Sources Drove Virginia Research and Development Activity in 2021? Findings from the National Science Foundation's Latest R&D Surveys

Research and development in Virginia are produced using diverse sources of funding. Among these are private businesses, the federal government, nonfederal governments, higher education institutions, and other nonprofit organizations. Information produced by the National Science Foundation's National Center for Science and Engineering Statistics provides a look into this activity. The business sector is by far the largest provider of Virginia R&D. In 2021, domestically performed business R&D accounted for $8.2 billion, or 55percent of the $15 billion state R&D total. However, the business sector's portion of total R&D spending is significantly lower than nationwide, with its annual share ranging between 69percent and 77percent since 2000. Virginia businesses continued to increase research and development in 2021, spending $8.2 billion on R&D in the Commonwealth, with funding from the companies' own sources accounting for $6.3 billion of this spending. Funding from other sources accounted for $1.8 billion.[5]

Of business spending on their own R&D, nonmanufacturing comprised around 71 percent of the total, with manufacturing making up 29 percent. In Virginia, the Information sector was the largest nonmanufacturing contributor, led by data processing, hosting, and related services ($682 million) with software publishers also a large contributor. Professional, scientific, and technical services was the second largest nonmanufacturing contributor, led by computer systems design and related services ($707 million). Transportation equipment led manufacturing with $468 million, followed by chemical manufacturing ($425 million), led by pharmaceuticals and medicines.[6]

Funding for R&D performed in Virginia by the higher education sector totaled $1.9 billion in 2021, or 13percent of the total compared to 11 percent nationwide. The federal government provided 45 percent of these expenditures in Virginia, but the share was over half nationwide. The difference in Virginia was mainly made up by spending by the colleges and universities themselves. Excluding higher education, state agency intramural R&D performance in 2021 totaled $17 million—a small share (about 0.1percent) of the state total.[7]

Federal government obligations for Virginia research and development were estimated at $10.3 billion in FY2022.[8] While federal government R&D output decreased from 2017 to 2021, federal R&D funding obligations in Virginia rose from $7.2 billion to $10.1 billion, a 41 percent current-dollar increase.[9] These obligations were dispersed among all sectors of the economy, with over 60 percent going to businesses, with a much smaller percentage going to colleges and universities than was the case nationwide.[10]

Conclusion

Recently published information from the Bureau of Economic Analysis and the National Science Foundation indicates that the Commonwealth of Virginia is a center of research and development activity, with the R&D economy expanding rapidly from 2017 to 2021. Its producers are more diversified in Virginia than nationwide, with less reliance on the business sector and relatively more reliance on the government and nonprofit institutions. However, over the five years, the federal government lost R&D output share even as federal funding obligations rose significantly. State and local government (including state universities) increased R&D over that period, while nonprofit organizations grew to become a significantly a more important source of research and development in Virginia than was the case nationwide.

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[5] National Center for Science and Engineering Statistics (NCSES). 2023. Business Enterprise Research and Development: 2021. Table 13. NSF 23-351. Alexandria, VA: National Science Foundation. Available at https://ncses.nsf.gov/surveys/business-enterprise-research-development/2021.

[6] Ibid. Table 29b.

[7] Ibid. Table 10.

[8] National Center for Science and Engineering Statistics (NCSES). 2024. Federal Funds for Research and Development: Fiscal Years 2022–23. Table 57. NSF 24-321. Alexandria, VA: National Science Foundation. Available at https://ncses.nsf.gov/surveys/federal-funds-research-development/2022-2023#data.

[9] Ibid. Table 94. FY 2018-2022.

[10] Ibid. Table 58.