

Region 9: Piedmont Opportunity Corridor

*Update on Entrepreneurial Trends:
Phase 2 Analysis of Broader
Innovation Ecosystem Measures*

September 14, 2021

Data Sources used for Phase 2 Update of Entrepreneurial Trends

- **Academic R&D** – annual research expenditures from all sources by university reported by the National Science Foundation’s Higher Education Research and Development Survey
- **Patent Activity of Inventors Residing in Region** – annual patents generated by residents in the region from U.S. Patent & Trademark Office data collected by Derwent Innovation
- **Venture Capital** – PitchBook database of private investor funding in emerging ventures, including pre-seed (accelerator and incubator funding), angel investor, seed and formal venture capital
- **Federal Small Business Innovation Research (SBIR) Awards** – SBIR funding by federal agencies to small businesses in the region as reported from SBIR.gov maintained by the U.S. Small Business Administration
- **SBA 7(a) Loan Activity** – Number of loans and loan amounts to small businesses in traded sector industries under SBA 7(a) financing vehicles as reported by the Small Business Administration

R&D Expenditures

- **What is it?** A measure of annual research expenditures by colleges and universities in the region across all sources of funding, such federal government, state government, industry, philanthropies/individual gifts and own institutional resources.
- **Why it matters?** Provides a measure of the region’s academic institutions potential to drive innovation – the economic literature finds that proximity to academic research has strong spillovers to innovation by specific industry clusters in a region.

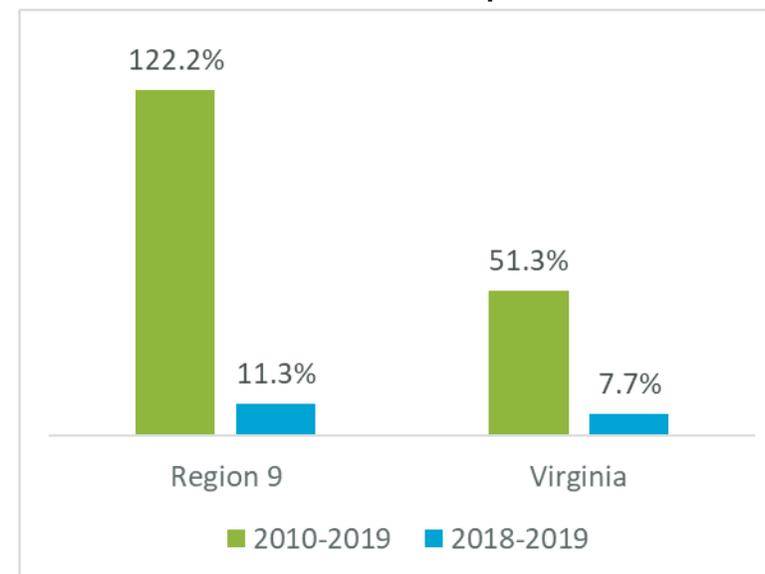
Academic R&D Expenditures (Millions)

Region 9	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
University of Virginia, Charlottesville	\$276.3	\$398.1	\$383.4	\$385.8	\$358.6	\$373.2	\$397.5	\$469.7	\$551.8	\$613.9	\$4,208.2

Academic R&D Expenditures, Top 5 Disciplines

Field	R&D Expenditures, 2010-19 (Mil)	% of Total
Health Sciences	\$1,638.5	38.9%
Biological and Biomedical Sciences	\$1,001.8	39.0%
Education	\$184.0	11.7%
Other Engineering	\$119.0	8.6%
Physics	\$103.9	8.2%

Growth in Academic R&D Expenditures



Patents Invented in the Region

- **What is it?** Patents are a primary way in which inventors are able to protect their innovations in products from being replicated.
- **Why it matters?** By focusing on patents generated by residents we are able to more accurately gauge the region's capacity to generate technology innovations. The patent classes help identify specific areas of technology innovation taking place in a region.

Total Patents, 2010-20

Region 9	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Patent Counts	220	236	291	246	308	281	258	308	297	324	306	3,075

Technology Class Area	Number of Patents, 2010-2020
electrical digital data processing	401
data processing systems or methods, specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes	241
transmission of digital information, e.g. telegraphic communication	240
diagnosis; surgery; identification	165
preparations for medical, dental, or toilet purposes	102
investigating or analysing materials by determining their chemical or physical properties	86
image data processing or generation, in general	69
card, board, or roulette games; indoor games using small moving playing bodies; video games	68
devices for introducing media into, or onto, the body	61
pictorial communication, e.g. television	57

Venture Capital Investments

- **What is it?** Venture capital represents equity investments made to emerging technology companies that offer high growth potential to generate sizable returns on that equity investment.
- **Why it matters?** Venture capital investments are a direct measure of innovation activity taking place in a region. Beyond the number of deals and investment taking place on an annual basis, it is important to also consider the stage at which investments are taking place to ensure a robust pipeline of emerging ventures being formed and gaining scale in a region.

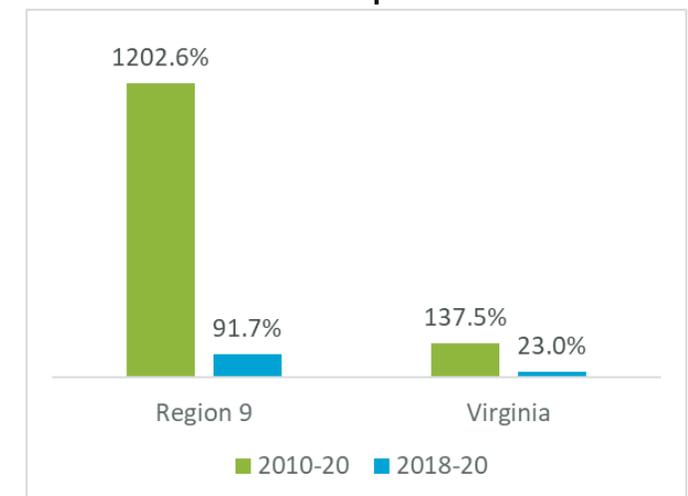
Venture Capital Activity

Region 9	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Deal Counts	8	10	11	28	21	20	45	38	26	44	30	281
Investment Totals (Millions)	\$12.0	\$30.3	\$16.6	\$54.0	\$42.2	\$17.4	\$45.4	\$109.6	\$81.2	\$77.2	\$155.7	\$641.4

Region 9	Pre-Seed	Angel	Seed	Early Stage	Later Stage	Total
Deal Counts	89	54	38	53	47	281
Investment Totals (Mil)	\$1.5	\$89.8	\$32.9	\$171.7	\$345.5	\$641.4

Source: PitchBook Data, Inc.; TEconomy calculations.

Growth in Venture Capital Investment



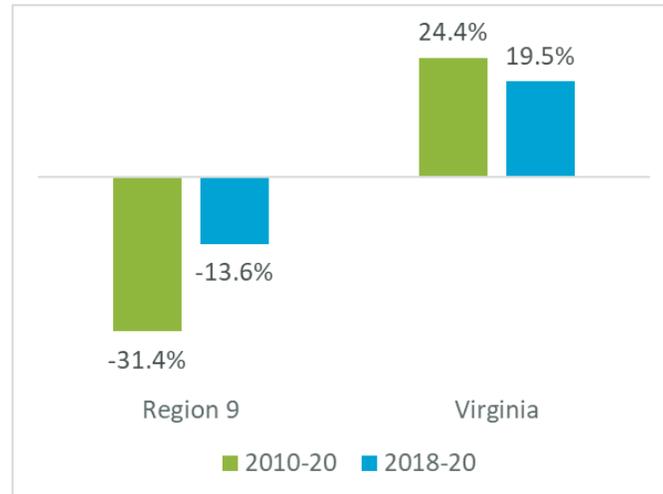
Federal Small Business Innovation Research (SBIR) Grants

- **What is it?** The federal Small Business Innovation Research (SBIR) program is a source of innovation funding for emerging technology companies. The SBIR program encourages small businesses to undertake technology commercialization by requiring federal agencies with extramural R&D budgets that exceed \$100 million to allocate 2.5 percent of their R&D budgets to the SBIR program. Each federal agency involved in the SBIR program then issues requests for proposals on topics reflecting their technology needs and interests, and competitively awards SBIR grants based on the technical merits and commercialization potential in a phased approach.
- **Why it matters?** SBIR awards are another direct measure of innovation activity taking place in a region by small businesses.

Small Business Innovation Research Awards

Region 9	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Award Counts	44	41	36	40	45	41	30	32	26	33	23	391
Award Amounts (Millions)	\$12.8	\$23.8	\$10.9	\$19.2	\$21.3	\$26.9	\$15.7	\$19.2	\$10.1	\$19.3	\$8.8	\$187.9

Growth in SBIR Award Dollar Totals



Source: www.SBIR.gov; TEconomy calculations.

Regional Use of SBA Loans

- **What is it?** U.S. Small Business Administration (SBA) 7(a) loans are that federal agency's primary program for financial assistance to small businesses across the nation. These loans are typically issued by private lenders based on SBA guarantees of 75% to 85% with amounts not to exceed \$5 million. Small businesses must demonstrate good credit/mgmt./ability to repay. Proceeds can be used for a variety of purposes: startup costs, buying land/buildings/equipment, new construction, working capital, and seasonal lines of credit.
- **Why it matters?** SBA 7(a) loan activity is a measure of how active regional small businesses in traded sectors are in seeking to grow their operations. It also helps measures availability of capital to small businesses in the region since lending in the SBA 7(a) program often is through local lending sources.

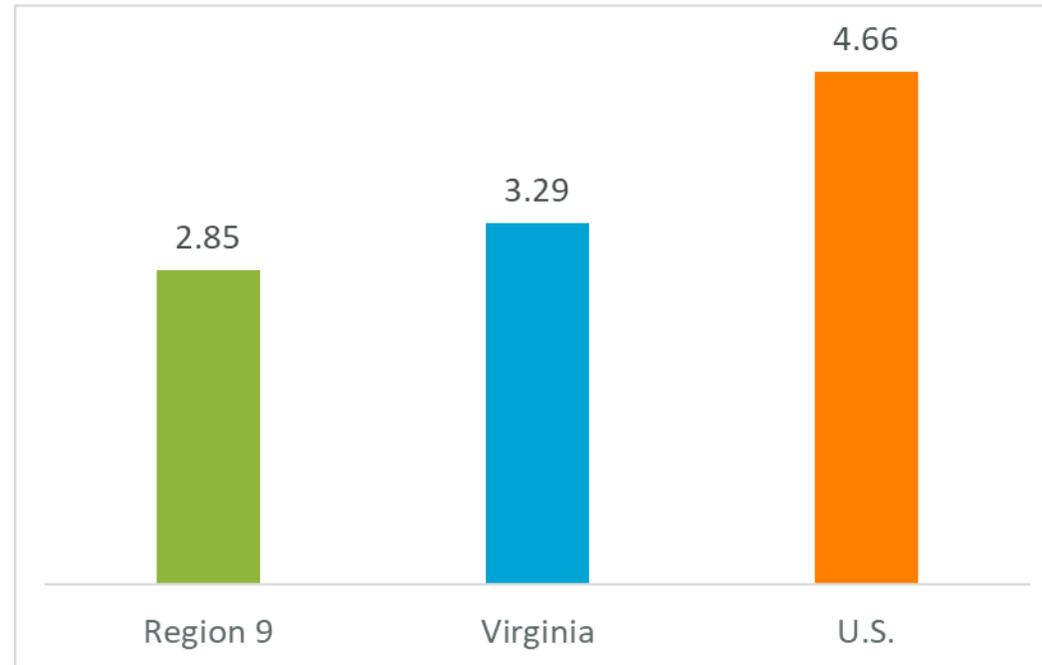
Region 9: SBA 7(a) Loans and Loan Amounts, Cumulative Totals 2010-20

Industry Clusters	Co's Receiving Loans	Total No. of Loans	Total Loan Amounts (\$ Millions)	% of Total Loan Amounts
Total, All Traded Sector Industries	128	138	\$56.3	100%
Agriculture & Food Processing	22	27	\$12.8	22.7%
Business Services	26	29	\$5.8	10.2%
Energy, Natural Resources, & Finished Products	4	4	\$0.3	0.6%
Engineering, R&D, Testing & Technical Services	3	3	\$0.4	0.7%
Financial & Insurance Services	4	5	\$3.3	5.8%
Information Technology & Communications Services	10	10	\$1.6	2.8%
Life Sciences	4	4	\$0.7	1.2%
Manufacturing	20	20	\$7.9	14.0%
Transportation, Distribution and Logistics	13	13	\$4.5	8.0%
All Other Traded Sectors	22	23	\$19.1	33.9%

Regional Utilization of SBA Loans vs. State & U.S. Totals

- **What is it?** By normalizing SBA 7(a) loans to traded sector small businesses by the number of traded sector establishments, it is possible to compare the level of lending activity in a region to that of the state and nation.
- **Why it matters?** High utilization of SBA 7(a) loans in a region suggests that the region has a growth-oriented traded sector small business base and/or good access to capital, while low utilization suggests a region's small businesses are not seeking to grow and/or are having trouble accessing capital.

**SBA 7(a) Loan Counts, Traded Sector Companies
Per 1,000 Establishments, Avg. 2018-2020**





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