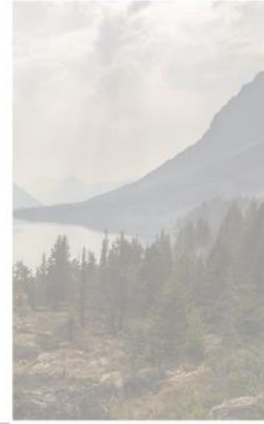
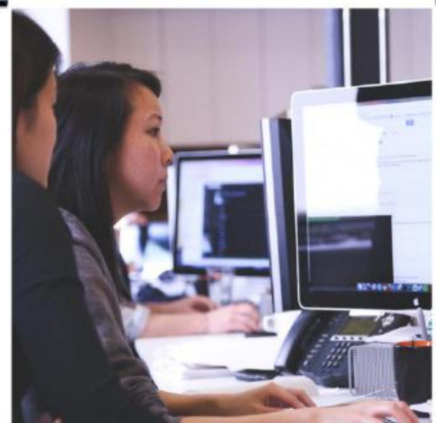
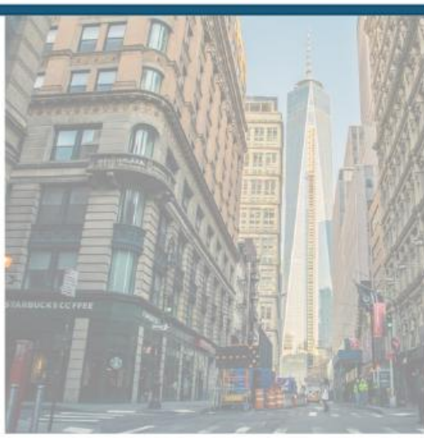
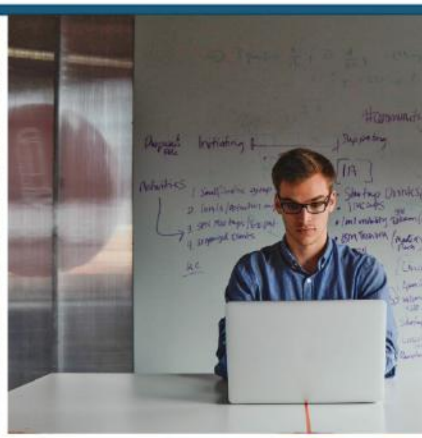



The 2017 State New Economy Index



Benchmarking Economic Transformation in the States


ITIF | INFORMATION TECHNOLOGY & INNOVATION FOUNDATION

The 2017 State New Economy Index

Benchmarking Economic Transformation in the States

Robert D. Atkinson and J. John Wu

November 2017

ITIF
INFORMATION TECHNOLOGY
& INNOVATION FOUNDATION

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"It is not the strongest of the species that survive, nor the most intelligent, but the ones most responsive to change."

— Charles Darwin

INTRODUCTION

Different geographies and jurisdictions play different roles in the global economy. Some specialize in what economists call “seedbed” functions—generating new products and firms, often through cutting-edge innovation. Others specialize in corporate functions by offering attractive environments for company headquarters or other management activities. Still others specialize in more routine production functions for goods or services, handling aspects of the work that involve less innovation and have lower skill requirements. Finally, some regions specialize in resource production tied to geographical endowments, such as minerals, arable land, or lumber.

Regardless of the particular focus of a regional or state economy, however, a defining trend of this era is the degree to which all have become more reliant on innovation as new technologies have become critical drivers of productivity and competitiveness. This is abundantly clear from both traditional economic data, such as high-tech export activity, and newer metrics, such as broadband deployment. All regions have technological or innovation-driven activity occurring locally, either because long-established industries such as agriculture, mining, manufacturing, and professional services are rapidly evolving into tech-enabled industries, or because new developments such as cloud computing and ubiquitous access to broadband Internet service allow innovators to create new, IT-enabled enterprises in virtually any connected small town or rural area they may choose.

Yet policy discussions about America’s innovation-driven, high-tech economy too often spotlight just a few iconic places, such as the Route 128 tech corridor around Boston, Massachusetts; Research Triangle Park between Raleigh, Durham, and Chapel Hill, North Carolina; Austin, Texas; Seattle, Washington; and, of course, California’s always white-hot Silicon Valley. This was the case when the first edition of this report came out almost 20 years ago, and it remains true for the most part today. It has always been too myopic a view of how innovation is distributed across the country, and it is increasingly out of step with reality, because many other metropolitan areas and regions—from Denver to Salt Lake City to Minneapolis and St. Paul—are becoming innovative hot spots, too.

An unfortunate result of this myopia has been that policy debates about innovation and economic development have come to be seen as the province of only the few states and regions that are recognizably tech-heavy, while others are typecast to focus on their traditional bread and butter. This needs to change, not only because the premise is incorrect, but also because the states’ and regions’ competitive positions in the U.S. and global economies hinge on developing broad-based understandings and support for modernizing policy frameworks to spur innovation and growth.

To be well positioned to take advantage of technological innovation and thrive amid the ebbs and flows of the global economy, states need to be firmly grounded in what we and others have called “New Economy” success factors. This report assembles an index of 25 indicators across five economic categories to assess states’ fundamental capacities to successfully navigate an economy driven by technological innovation. It measures the degree to which state economies are knowledge-based, globalized, entrepreneurial, IT-driven, and innovation-based. The report then discusses some overarching strategic issues facing states, examines the role of large and small businesses in driving growth, and finally discusses a number of innovative models around the nation to spur workforce training and technology commercialization.

THE INDEX

The purpose of the *State New Economy Index* is to measure states' economic *structure.* Unlike other reports that assess state economic performance or state economic policies, this study focuses more narrowly on a simple question: To what degree does the structure of the 50 state economies match the ideal structure of the innovation-driven New Economy? For example, we know that a defining characteristic of the New Economy is that it is global. Therefore, the *Index* uses a number of variables to measure state economies' degrees of global integration.

This edition of the *Index* builds on seven prior editions*,* which were published in 1999, 2002, 2007, 2008, 2010, 2012, and 2014.[1] It now uses 25 indicators, which are divided into five categories that best capture what is important about the New Economy:

1. **Knowledge jobs:** Indicators measure employment of IT professionals outside the IT industry; jobs held by managers, professionals, and technicians; the educational attainment of the entire workforce; immigration of knowledge workers; migration of domestic knowledge workers; worker productivity in the manufacturing sector; and employment in high-wage traded services.

2. **Globalization:** Indicators measure foreign direct investment; export orientation of manufacturing and services; and the share of each state's output that goes to high-tech goods and services exports.

3. **Economic dynamism:** Indicators measure the degree of business churn (i.e., the percentage of new business start-ups and failures); the number of fast-growing firms (businesses listed in the Inc. 5000 index); the number and value of initial public stock offerings (IPOs) by companies; and the number of individual inventor patents granted.

4. **The digital economy:** Indicators measure Internet and computer use by farmers; the degree to which state governments use information technologies to deliver services; adoption rates and speed of broadband telecommunications; and use of information technology in the health care system.

5. **Innovation capacity:** Indicators measure the number of jobs in high-tech industries such as electronics manufacturing, telecommunications, and biomedical industries; the number of scientists and engineers in the workforce; the number of patents granted; industry investment in research and development; non-industry investment in research and development; movement toward a clean energy economy; and venture capital investment.

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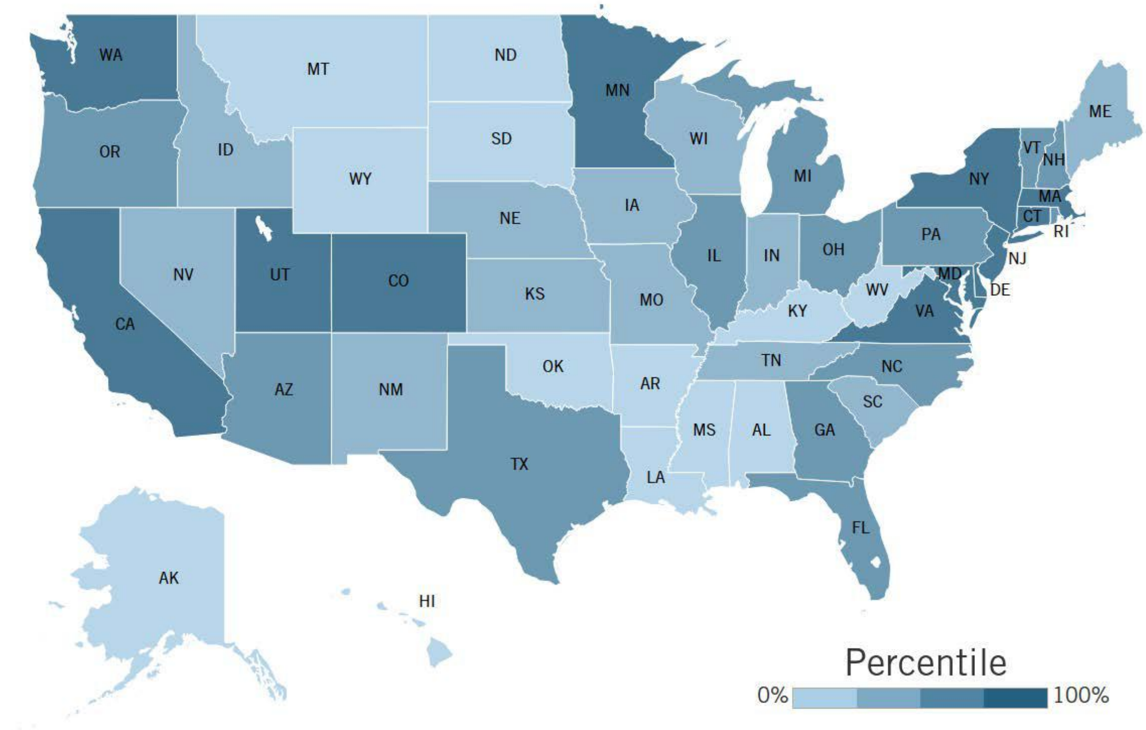
OVERALL SCORES



2017 Rank	2017 Score	State	2014 Rank	2012 Rank	2010 Rank	2007 Rank	2002 Rank	1999 Rank	Rank Change from 2014*
1	96.6	Massachusetts	1	1	1	1	1	1	0
2	84.7	California	3	4	7	5	2	2	+1
3	84.5	Washington	4	3	2	4	4	4	+1
4	81.7	Virginia	7	6	8	8	8	12	+3
5	80.4	Delaware	2	2	6	7	9	9	-3
6	78.9	Maryland	5	5	3	3	5	11	-1
7	78.3	Colorado	6	7	9	9	3	3	-1
8	77.6	New Jersey	10	10	4	2	6	8	+2
9	77.3	Utah	9	8	12	12	16	6	0
10	76.4	Connecticut	8	9	5	6	7	5	-2
11	74.5	New York	12	11	10	10	11	16	+1
12	72.6	Minnesota	13	13	13	11	14	14	+1
13	71.4	Oregon	15	14	14	17	13	15	+2
13	71.4	New Hampshire	11	12	11	13	12	7	-2
15	70.6	Michigan	18	19	17	19	22	34	+3
16	69.2	Illinois	16	20	15	16	19	22	0

2017 Rank	2017 Score	State	2014 Rank	2012 Rank	2010 Rank	2007 Rank	2002 Rank	1999 Rank	Rank Change from 2014*
17	67.5	Texas	20	17	18	14	10	17	+3
18	66.8	Vermont	14	15	23	20	26	18	-4
18	66.8	Georgia	21	18	19	18	18	25	+3
20	66.7	Rhode Island	19	23	16	15	23	29	-1
21	66.5	Arizona	17	16	20	22	15	10	-4
22	65.6	North Carolina	23	25	24	26	24	30	+1
23	64.4	Pennsylvania	22	22	22	21	21	24	-1
24	62.7	Florida	25	21	21	23	17	20	+1
25	61.3	Ohio	29	32	25	29	27	33	+4
26	60.4	Wisconsin	30	31	29	30	37	32	+4
27	59.9	Nebraska	35	35	34	28	36	36	+8
28	59.0	Missouri	33	33	33	35	28	35	+5
29	58.5	Idaho	24	24	27	24	20	23	-5
30	57.5	Kansas	31	29	26	34	30	27	+1
31	57.4	Nevada	27	26	30	27	31	21	-4
32	56.9	Tennessee	40	39	41	36	34	31	+8
33	55.9	Indiana	38	42	35	31	32	37	+5
34	55.8	New Mexico	26	30	32	33	25	19	-8
35	55.3	South Carolina	34	40	39	39	35	38	-1
36	55.2	Maine	28	27	28	32	29	28	-8
37	54.8	Iowa	37	38	38	38	40	42	0
38	51.8	North Dakota	36	34	36	37	47	45	-2
39	50.5	Kentucky	44	45	44	45	42	39	+5
40	50.1	Hawaii	43	36	40	41	38	26	+3
41	49.5	South Dakota	42	43	45	48	46	43	+1
42	49.4	Alaska	32	28	31	25	39	13	-10
43	49.1	Montana	39	37	37	42	41	46	-4
44	48.2	Alabama	41	46	47	46	45	44	-3
45	47.9	Oklahoma	48	47	42	40	33	40	+3
46	47.6	Louisiana	46	44	43	44	44	47	0
47	47.1	Wyoming	45	41	46	43	43	41	-2
48	44.1	West Virginia	49	49	49	50	48	48	+1
49	42.8	Arkansas	47	48	48	47	49	49	-2
50	37.9	Mississippi	50	50	50	49	50	50	0

**Due to changes in methodology, change ranks cannot be positively attributed to changes in the economic conditions or structure of a state economy.*

INDICATOR SCORES BY RANK

	OVERALL		Information Technology Jobs		Managerial, Professional, and Technical Jobs		Workforce Education		Immigration of Knowledge Workers		Internal Migration of U.S. Knowledge Workers		Manufacturing Value Added		High-Wage Traded Services		Foreign Direct Investment		Export Focus of Manufacturing		High-Tech Exports		Business Churning		Fast-Growing Firms	
State	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Massachusetts	1	96.6	5	2.7%	1	38.9%	1	0.59	17	0.66	1	0.88	10	$240	8	12.4%	5	7.4%	4	$91,297	9	4.3%	15	19.5%	4	0.11%
California	2	84.7	12	2.4%	9	32.4%	18	0.47	13	0.68	5	0.75	18	$223	7	12.5%	27	4.9%	5	$88,653	7	4.4%	1	22.3%	10	0.09%
Washington	3	84.5	1	4.2%	7	32.5%	8	0.52	8	0.73	13	0.67	11	$236	26	10.0%	36	4.2%	1	$156,266	7	4.4%	21	18.6%	12	0.08%
Virginia	4	81.7	2	3.0%	7	32.5%	5	0.54	15	0.67	5	0.75	2	$267	6	13.0%	20	5.9%	19	$53,761	33	1.9%	11	20.0%	1	0.20%
Delaware	5	80.4	4	2.8%	13	31.2%	18	0.47	12	0.70	20	0.62	4	$249	2	14.8%	2	7.8%	10	$71,571	4	5.0%	10	20.1%	21	0.07%
Maryland	6	78.9	5	2.7%	4	33.4%	2	0.56	20	0.64	4	0.76	3	$266	28	9.9%	26	5.0%	33	$41,840	34	1.8%	22	18.5%	5	0.10%
Colorado	7	78.3	3	2.9%	6	32.9%	2	0.56	22	0.62	10	0.69	12	$231	12	11.9%	32	4.5%	27	$48,042	29	2.2%	6	21.3%	5	0.10%
New Jersey	8	77.6	9	2.6%	11	32.2%	8	0.52	13	0.68	8	0.73	38	$195	10	12.1%	4	7.5%	7	$85,849	15	3.3%	8	20.8%	12	0.08%
Utah	9	77.3	18	2.2%	17	30.5%	12	0.49	36	0.53	26	0.59	22	$221	14	11.5%	48	3.5%	26	$49,043	13	3.6%	4	22.0%	2	0.16%
Connecticut	10	76.4	14	2.3%	2	34.7%	4	0.55	11	0.72	7	0.74	6	$246	3	14.7%	10	7.0%	22	$50,073	38	1.6%	50	15.1%	26	0.06%
New York	11	74.5	18	2.2%	3	33.6%	11	0.51	28	0.57	2	0.83	27	$214	1	15.1%	22	5.7%	3	$91,463	34	1.8%	25	18.3%	12	0.08%
Minnesota	12	72.6	5	2.7%	5	33.1%	8	0.52	21	0.63	13	0.67	15	$226	4	13.8%	32	4.5%	21	$51,660	26	2.4%	41	16.2%	12	0.08%
Oregon	13	71.4	25	1.8%	14	30.8%	12	0.49	5	0.75	13	0.67	17	$224	17	11.0%	45	3.6%	23	$49,755	2	7.6%	29	17.6%	21	0.07%
New Hampshire	13	71.4	31	1.5%	14	30.8%	6	0.53	1	1.03	12	0.68	18	$223	25	10.2%	2	7.8%	32	$42,444	11	3.9%	20	18.7%	21	0.07%
Michigan	15	70.6	25	1.8%	19	30.3%	26	0.44	5	0.75	20	0.62	25	$216	32	9.3%	17	6.1%	16	$57,137	22	2.5%	44	15.9%	21	0.07%
Illinois	16	69.2	10	2.5%	10	32.3%	12	0.49	17	0.66	10	0.69	31	$209	5	13.5%	20	5.9%	9	$73,574	22	2.5%	46	15.8%	10	0.09%
Texas	17	67.5	20	2.1%	26	28.9%	34	0.42	42	0.51	18	0.63	7	$245	19	10.9%	22	5.7%	2	$111,491	3	6.5%	17	19.1%	5	0.10%
Vermont	18	66.8	40	1.2%	12	31.5%	6	0.53	2	1.01	3	0.77	44	$183	46	6.4%	29	4.6%	17	$56,528	1	9.4%	36	16.5%	47	0.01%
Georgia	18	66.8	10	2.5%	20	30.1%	26	0.44	38	0.52	34	0.55	24	$218	8	12.4%	14	6.4%	13	$65,206	27	2.3%	16	19.3%	3	0.13%
Rhode Island	20	66.7	14	2.3%	16	30.6%	12	0.49	32	0.55	9	0.71	43	$185	17	11.0%	6	7.3%	49	$25,620	38	1.6%	17	19.1%	35	0.04%
Arizona	21	66.5	5	2.7%	18	30.4%	30	0.43	47	0.45	32	0.56	9	$241	23	10.3%	37	4.1%	14	$61,881	19	2.8%	7	21.1%	5	0.10%
North Carolina	22	65.6	20	2.1%	25	29.1%	23	0.45	38	0.52	18	0.63	12	$231	21	10.5%	8	7.2%	20	$53,032	16	3.0%	22	18.5%	12	0.08%
Pennsylvania	23	64.4	20	2.1%	21	29.8%	26	0.44	36	0.53	13	0.67	20	$222	13	11.7%	18	6.0%	18	$54,939	30	2.1%	35	16.6%	12	0.08%
Florida	24	62.7	27	1.7%	37	27.0%	30	0.43	46	0.46	34	0.55	27	$214	20	10.8%	39	4.0%	12	$66,339	16	3.0%	1	22.3%	12	0.08%
Ohio	25	61.3	20	2.1%	21	29.8%	39	0.41	24	0.60	29	0.58	25	$216	14	11.5%	24	5.6%	28	$47,523	32	2.0%	48	15.4%	5	0.10%
Wisconsin	26	60.4	12	2.4%	30	28.5%	26	0.44	27	0.58	26	0.59	27	$214	22	10.4%	43	3.8%	38	$39,199	22	2.5%	38	16.3%	31	0.05%
Nebraska	27	59.9	14	2.3%	27	28.8%	18	0.47	28	0.57	22	0.60	23	$220	10	12.1%	37	4.1%	25	$49,319	43	1.3%	19	19.0%	26	0.06%
Missouri	28	59.0	14	2.3%	23	29.7%	30	0.43	15	0.67	32	0.56	30	$212	16	11.3%	29	4.6%	29	$46,218	38	1.6%	14	19.7%	26	0.06%
Idaho	29	58.5	40	1.2%	31	28.4%	34	0.42	25	0.59	45	0.45	47	$177	43	7.4%	49	3.0%	36	$39,440	5	4.8%	4	22.0%	39	0.03%
Kansas	30	57.5	24	1.9%	31	28.4%	16	0.48	38	0.52	26	0.59	34	$202	26	10.0%	15	6.3%	31	$43,331	37	1.7%	27	18.0%	26	0.06%
Nevada	31	57.4	44	1.0%	50	21.7%	43	0.38	49	0.34	43	0.48	1	$302	39	8.2%	35	4.3%	6	$86,061	41	1.5%	1	22.3%	31	0.05%
Tennessee	32	56.9	31	1.5%	36	27.2%	41	0.39	32	0.55	37	0.54	14	$228	36	8.6%	18	6.0%	24	$49,440	11	3.9%	29	17.6%	12	0.08%
Indiana	33	55.9	36	1.4%	38	26.8%	41	0.39	28	0.57	34	0.55	20	$222	42	7.5%	12	6.8%	40	$37,873	10	4.2%	44	15.9%	26	0.06%
New Mexico	34	55.8	31	1.5%	27	28.8%	34	0.42	48	0.35	31	0.57	38	$195	45	6.5%	45	3.6%	39	$38,344	19	2.8%	11	20.0%	39	0.03%
South Carolina	35	55.3	31	1.5%	43	26.0%	39	0.41	22	0.62	29	0.58	32	$206	34	8.8%	1	8.5%	11	$71,180	22	2.5%	29	17.6%	12	0.08%
Maine	36	55.2	30	1.6%	24	29.6%	23	0.45	8	0.73	22	0.60	44	$183	38	8.3%	13	6.6%	45	$32,247	44	0.9%	38	16.3%	39	0.03%
Iowa	37	54.8	27	1.7%	33	28.3%	34	0.42	7	0.74	39	0.50	5	$247	28	9.9%	34	4.4%	30	$43,627	34	1.8%	48	15.4%	35	0.04%
North Dakota	38	51.8	42	1.1%	47	25.6%	23	0.45	38	0.52	39	0.50	37	$201	43	7.4%	45	3.6%	43	$35,115	44	0.9%	9	20.7%	35	0.04%
Kentucky	39	50.5	39	1.3%	43	26.0%	46	0.37	44	0.49	42	0.49	33	$205	37	8.5%	9	7.1%	15	$57,816	13	3.6%	37	16.4%	31	0.05%
Hawaii	40	50.1	47	0.8%	41	26.3%	16	0.48	25	0.59	17	0.66	50	$108	39	8.2%	6	7.3%	41	$35,786	49	0.5%	33	17.3%	44	0.02%
South Dakota	41	49.5	36	1.4%	43	26.0%	34	0.42	17	0.66	50	0.39	40	$192	33	8.9%	43	3.8%	47	$27,914	48	0.6%	46	15.8%	39	0.03%
Alaska	42	49.4	42	1.1%	34	27.9%	21	0.46	8	0.73	22	0.60	49	$113	31	9.5%	11	6.9%	50	$8,694	50	0.2%	24	18.4%	47	0.01%
Montana	43	49.1	44	1.0%	42	26.1%	21	0.46	4	0.79	22	0.60	34	$202	49	5.9%	50	1.9%	46	$31,456	44	0.9%	27	18.0%	44	0.02%
Alabama	44	48.2	36	1.4%	39	26.5%	43	0.38	31	0.56	39	0.50	34	$202	41	8.0%	16	6.2%	42	$35,538	30	2.1%	38	16.3%	21	0.07%
Oklahoma	45	47.9	27	1.7%	29	28.6%	43	0.38	45	0.48	48	0.43	44	$183	34	8.8%	40	3.9%	37	$39,231	44	0.9%	26	18.1%	35	0.04%
Louisiana	46	47.6	47	0.8%	43	26.0%	47	0.35	32	0.55	37	0.54	16	$225	30	9.8%	29	4.6%	8	$85,545	6	4.6%	34	16.7%	31	0.05%
Wyoming	47	47.1	50	0.6%	48	25.5%	30	0.43	3	0.93	45	0.45	48	$173	50	5.5%	40	3.9%	44	$33,574	21	2.6%	13	19.9%	47	0.01%
West Virginia	48	44.1	44	1.0%	35	27.3%	50	0.31	32	0.55	49	0.40	8	$243	47	6.1%	25	5.1%	34	$40,934	16	3.0%	43	16.1%	39	0.03%
Arkansas	49	42.8	31	1.5%	39	26.5%	47	0.35	43	0.50	44	0.47	42	$188	23	10.3%	28	4.8%	48	$26,492	41	1.5%	29	17.6%	47	0.01%
Mississippi	50	37.9	47	0.8%	49	25.0%	47	0.35	50	0.30	45	0.45	40	$192	47	6.1%	40	3.9%	35	$39,548	27	2.3%	41	16.2%	44	0.02%
U.S. Average	-	62.7	-	2.1%	-	30.3%	-	0.46	-	0.59	-	0.63	-	$218	-	11.3%	-	5.5%	-	$68,446	-	3.2%	-	19.0%	-	0.08%

	Initial Public Offerings		Inventor Patents		Online Agriculture		E-Government		Broadband Telecommunications		Health IT		High-Tech Jobs		Scientists and Engineers		Patents		Industry Investment in R&D		Non-Industry Investment in R&D		Movement Toward a Green Economy		Venture Capital	
State	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
MA	3	6.78	4	0.111	1	6.65	21	90	10	5.91	4	5.84	1	7.9%	3	5.1%	9	15.7	4	2.1%	3	1.4%	10	5.35	2	1.27%
CA	8	5.58	2	0.142	14	5.76	11	93	21	5.21	30	5.01	5	6.8%	7	4.3%	13	14.6	3	2.5%	10	0.7%	30	4.90	1	1.28%
WA	27	4.68	8	0.100	11	5.82	6	97	8	5.96	5	5.72	4	6.9%	1	5.4%	18	12.5	10	1.7%	10	0.7%	5	5.63	6	0.00%
VA	28	4.66	31	0.056	39	4.18	1	100	4	6.34	3	5.85	16	4.8%	2	5.2%	31	7.5	35	0.7%	6	1.1%	17	5.15	4	0.45%
DE	41	4.25	45	0.040	25	4.79	35	87	1	6.45	29	5.02	15	5.0%	14	3.4%	1	24.5	1	4.1%	42	0.3%	38	4.75	19	0.07%
MD	12	5.28	14	0.086	25	4.79	21	90	5	6.23	2	6.08	8	6.1%	5	4.8%	17	13.0	25	0.9%	2	4.1%	14	5.25	15	0.08%
CO	5	6.19	5	0.104	17	5.56	11	93	38	4.38	18	5.22	7	6.6%	4	4.9%	6	17.0	15	1.3%	10	0.7%	13	5.30	7	0.22%
NJ	22	4.89	11	0.092	7	6.20	43	83	9	5.95	34	4.80	9	5.6%	8	3.9%	2	19.5	7	1.9%	42	0.3%	19	5.12	19	0.07%
UT	10	5.42	1	0.169	15	5.61	1	100	6	6.13	24	5.14	6	6.7%	14	3.4%	21	10.8	16	1.2%	14	0.6%	39	4.65	5	0.43%
CT	2	6.91	9	0.099	1	6.65	11	93	13	5.68	45	4.21	18	4.7%	10	3.7%	11	15.5	5	2.0%	29	0.4%	43	4.53	15	0.08%
NY	8	5.58	15	0.081	24	4.85	21	90	14	5.59	1	6.51	24	4.2%	29	2.8%	9	15.7	25	0.9%	19	0.5%	43	4.53	3	0.52%
MN	38	4.40	7	0.102	19	5.53	11	93	15	5.55	8	5.40	14	5.3%	8	3.9%	3	17.5	8	1.8%	29	0.4%	37	4.76	12	0.10%
OR	41	4.25	10	0.097	8	6.07	21	90	7	6.02	25	5.11	9	5.6%	22	3.1%	24	9.8	5	2.0%	29	0.4%	7	5.53	14	0.09%
NH	32	4.58	3	0.114	1	6.65	35	87	16	5.44	36	4.79	3	7.1%	12	3.6%	24	9.8	31	0.8%	19	0.5%	40	4.64	19	0.07%
MI	28	4.66	16	0.079	28	4.74	1	100	12	5.81	13	5.36	13	5.4%	6	4.4%	4	17.1	2	3.0%	14	0.6%	32	4.88	25	0.05%
IL	22	4.89	23	0.064	20	5.50	11	93	26	5.02	18	5.22	24	4.2%	18	3.2%	20	10.9	8	1.8%	19	0.5%	35	4.78	9	0.14%
TX	7	5.64	21	0.067	37	4.29	21	90	42	4.12	21	5.16	21	4.4%	13	3.5%	30	7.9	20	1.0%	29	0.4%	33	4.85	15	0.08%
VT	13	5.22	16	0.079	1	6.65	35	87	21	5.21	44	4.27	18	4.7%	30	2.7%	19	11.9	20	1.0%	29	0.4%	2	6.22	34	0.01%
GA	24	4.83	33	0.054	36	4.34	6	97	27	4.93	26	5.07	24	4.2%	22	3.1%	32	7.3	25	0.9%	19	0.5%	11	5.33	8	0.16%
RI	1	8.76	23	0.064	1	6.65	47	80	2	6.44	42	4.36	21	4.4%	18	3.2%	26	9.7	20	1.0%	4	1.3%	50	3.84	27	0.04%
AZ	19	5.11	12	0.090	47	3.57	21	90	33	4.66	41	4.43	16	4.8%	10	3.7%	16	13.6	12	1.6%	19	0.5%	25	4.97	19	0.07%
NC	16	5.16	39	0.046	27	4.77	11	93	28	4.87	20	5.18	9	5.6%	18	3.2%	36	6.3	20	1.0%	10	0.7%	15	5.24	11	0.12%
PA	11	5.37	33	0.054	43	3.87	11	93	3	6.42	39	4.63	21	4.4%	22	3.1%	28	8.5	10	1.7%	14	0.6%	48	4.05	12	0.10%
FL	25	4.75	13	0.088	23	4.97	11	93	25	5.04	11	5.38	34	3.7%	36	2.1%	14	14.5	25	0.9%	29	0.4%	19	5.12	10	0.13%
OH	25	4.75	23	0.064	34	4.39	1	100	34	4.65	8	5.40	35	3.6%	16	3.3%	23	9.9	18	1.1%	19	0.5%	28	4.93	27	0.04%
WI	31	4.59	26	0.062	22	5.10	6	97	11	5.90	26	5.07	20	4.5%	16	3.3%	27	9.0	18	1.1%	19	0.5%	45	4.50	27	0.04%
NE	33	4.51	26	0.062	12	5.79	21	90	20	5.23	30	5.01	37	3.5%	26	2.9%	33	7.1	36	0.6%	29	0.4%	28	4.93	30	0.03%
MO	34	4.50	42	0.043	38	4.28	1	100	40	4.32	37	4.71	30	4.0%	26	2.9%	38	6.0	13	1.5%	29	0.4%	46	4.46	15	0.08%
ID	6	6.16	19	0.074	16	5.59	21	90	45	3.83	43	4.34	12	5.5%	33	2.5%	8	16.2	13	1.5%	7	1.0%	22	5.10	43	0.00%
KS	16	5.16	29	0.060	32	4.62	50	77	34	4.65	48	4.00	32	3.9%	25	3.0%	35	6.5	31	0.8%	29	0.4%	1	6.29	34	0.01%
NV	4	6.30	5	0.104	47	3.57	43	83	23	5.08	28	5.06	47	2.5%	49	1.4%	4	17.1	20	1.0%	50	0.1%	19	5.12	19	0.07%
TN	14	5.20	39	0.046	42	3.95	11	93	24	5.06	7	5.41	33	3.8%	36	2.1%	43	4.2	39	0.5%	8	0.8%	27	4.94	24	0.06%
IN	40	4.36	36	0.050	31	4.64	6	97	28	4.87	13	5.36	27	4.1%	33	2.5%	41	5.4	16	1.2%	29	0.4%	42	4.61	32	0.02%
NM	36	4.45	32	0.055	50	3.41	35	87	48	3.46	16	5.25	2	7.3%	18	3.2%	7	16.9	39	0.5%	1	5.8%	35	4.78	34	0.01%
SC	41	4.25	43	0.041	41	3.96	35	87	32	4.71	49	3.99	27	4.1%	32	2.6%	33	7.1	39	0.5%	19	0.5%	24	5.00	34	0.01%
ME	41	4.25	43	0.041	1	6.65	21	90	19	5.29	40	4.57	41	3.0%	41	2.0%	29	8.4	31	0.8%	29	0.4%	6	5.57	34	0.01%
IA	35	4.48	33	0.054	17	5.56	21	90	37	4.47	32	4.94	35	3.6%	35	2.4%	40	5.5	25	0.9%	19	0.5%	16	5.16	34	0.01%
ND	30	4.64	30	0.057	12	5.79	6	97	18	5.31	10	5.39	41	3.0%	36	2.1%	39	5.8	36	0.6%	19	0.5%	49	4.01	43	0.00%
KY	21	4.93	48	0.029	44	3.85	21	90	41	4.19	33	4.86	38	3.2%	42	1.9%	45	3.1	36	0.6%	42	0.3%	8	5.46	25	0.05%
HI	14	5.20	36	0.050	28	4.74	21	90	36	4.64	50	3.18	48	2.4%	46	1.7%	15	14.2	25	0.9%	14	0.6%	3	5.64	43	0.00%
SD	18	5.13	16	0.079	21	5.28	35	87	17	5.40	34	4.80	38	3.2%	36	2.1%	36	6.3	39	0.5%	42	0.3%	26	4.95	43	0.00%
AK	41	4.25	22	0.065	28	4.74	47	80	38	4.38	6	5.69	27	4.1%	30	2.7%	47	2.6	47	0.2%	29	0.4%	3	5.64	43	0.00%
MT	41	4.25	20	0.071	10	5.84	35	87	30	4.79	38	4.67	44	2.6%	43	1.8%	21	10.8	44	0.4%	14	0.6%	22	5.10	30	0.03%
AL	38	4.40	46	0.033	45	3.77	43	83	47	3.61	22	5.15	30	4.0%	26	2.9%	48	2.2	39	0.5%	4	1.3%	41	4.63	32	0.02%
OK	20	4.97	36	0.050	33	4.46	35	87	43	4.07	15	5.33	43	2.7%	36	2.1%	42	5.1	44	0.4%	42	0.3%	11	5.33	43	0.00%
LA	37	4.44	39	0.046	40	4.03	43	83	46	3.65	46	4.16	44	2.6%	43	1.8%	44	3.5	47	0.2%	42	0.3%	9	5.37	34	0.01%
WY	41	4.25	26	0.062	9	5.99	47	80	44	3.85	17	5.24	48	2.4%	46	1.7%	12	14.9	50	0.1%	49	0.2%	18	5.14	43	0.00%
WV	41	4.25	46	0.033	46	3.64	11	93	31	4.72	47	4.10	44	2.6%	48	1.5%	46	3.0	31	0.8%	29	0.4%	47	4.27	34	0.01%
AR	41	4.25	49	0.026	35	4.36	21	90	49	3.34	12	5.37	48	2.4%	43	1.8%	49	1.8	46	0.3%	42	0.3%	34	4.79	34	0.01%
MS	41	4.25	50	0.021	49	3.49	21	90	50	3.17	22	5.15	40	3.1%	50	1.2%	50	1.3	47	0.2%	8	0.8%	30	4.90	43	0.00%
U.S.	-	5.00	-	0.079	-	5.00	-	90	-	5.00	-	5.00	-	4.8%	-	3.4%	-	10.3	-	1.5%	-	0.7%	-	5.00	-	0.33%

INDICATOR SCORE BY STATE

	OVERALL		Information Technology Jobs		Managerial, Professional, and Technical Jobs		Workforce Education		Immigration of Knowledge Workers		Internal Migration of U.S. Knowledge Workers		Manufacturing Value Added		High-Wage Traded Services		Foreign Direct Investment		Export Focus of Manufacturing		High-Tech Exports		Business Churning		Fast-Growing Firms	
State	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Alabama	44	48.2	36	1.4%	39	26.5%	43	0.38	31	0.56	39	0.50	34	$202	41	8.0%	16	6.2%	42	$35,538	30	2.1%	38	16.3%	21	0.07%
Alaska	42	49.4	42	1.1%	34	27.9%	21	0.46	8	0.73	22	0.60	49	$113	31	9.5%	11	6.9%	50	$8,694	50	0.2%	24	18.4%	47	0.01%
Arizona	21	66.5	5	2.7%	18	30.4%	30	0.43	47	0.45	32	0.56	9	$241	23	10.3%	37	4.1%	14	$61,881	19	2.8%	7	21.1%	5	0.10%
Arkansas	49	42.8	31	1.5%	39	26.5%	47	0.35	43	0.50	44	0.47	42	$188	23	10.3%	28	4.8%	48	$26,492	41	1.5%	29	17.6%	47	0.01%
California	2	84.7	12	2.4%	9	32.4%	18	0.47	13	0.68	5	0.75	18	$223	7	12.5%	27	4.9%	5	$88,653	7	4.4%	1	22.3%	10	0.09%
Colorado	7	78.3	3	2.9%	6	32.9%	2	0.56	22	0.62	10	0.69	12	$231	12	11.9%	32	4.5%	27	$48,042	29	2.2%	6	21.3%	5	0.10%
Connecticut	10	76.4	14	2.3%	2	34.7%	4	0.55	11	0.72	7	0.74	6	$246	3	14.7%	10	7.0%	22	$50,073	38	1.6%	50	15.1%	26	0.06%
Delaware	5	80.4	4	2.8%	13	31.2%	18	0.47	12	0.70	20	0.62	4	$249	2	14.8%	2	7.8%	10	$71,571	4	5.0%	10	20.1%	21	0.07%
Florida	24	62.7	27	1.7%	37	27.0%	30	0.43	46	0.46	34	0.55	27	$214	20	10.8%	39	4.0%	12	$66,339	16	3.0%	1	22.3%	12	0.08%
Georgia	18	66.8	10	2.5%	20	30.1%	26	0.44	38	0.52	34	0.55	24	$218	8	12.4%	14	6.4%	13	$65,206	27	2.3%	16	19.3%	3	0.13%
Hawaii	40	50.1	47	0.8%	41	26.3%	16	0.48	25	0.59	17	0.66	50	$108	39	8.2%	6	7.3%	41	$35,786	49	0.5%	33	17.3%	44	0.02%
Idaho	29	58.5	40	1.2%	31	28.4%	34	0.42	25	0.59	45	0.45	47	$177	43	7.4%	49	3.0%	36	$39,440	5	4.8%	4	22.0%	39	0.03%
Illinois	16	69.2	10	2.5%	10	32.3%	12	0.49	17	0.66	10	0.69	31	$209	5	13.5%	20	5.9%	9	$73,574	22	2.5%	46	15.8%	10	0.09%
Indiana	33	55.9	36	1.4%	38	26.8%	41	0.39	28	0.57	34	0.55	20	$222	42	7.5%	12	6.8%	40	$37,873	10	4.2%	44	15.9%	26	0.06%
Iowa	37	54.8	27	1.7%	33	28.3%	34	0.42	7	0.74	39	0.50	5	$247	28	9.9%	34	4.4%	30	$43,627	34	1.8%	48	15.4%	35	0.04%
Kansas	30	57.5	24	1.9%	31	28.4%	16	0.48	38	0.52	26	0.59	34	$202	26	10.0%	15	6.3%	31	$43,331	37	1.7%	27	18.0%	26	0.06%
Kentucky	39	50.5	39	1.3%	43	26.0%	46	0.37	44	0.49	42	0.49	33	$205	37	8.5%	9	7.1%	15	$57,816	13	3.6%	37	16.4%	31	0.05%
Louisiana	46	47.6	47	0.8%	43	26.0%	47	0.35	32	0.55	37	0.54	16	$225	30	9.8%	29	4.6%	8	$85,545	6	4.6%	34	16.7%	31	0.05%
Maine	36	55.2	30	1.6%	24	29.6%	23	0.45	8	0.73	22	0.60	44	$183	38	8.3%	13	6.6%	45	$32,247	44	0.9%	38	16.3%	39	0.03%
Maryland	6	78.9	5	2.7%	4	33.4%	2	0.56	20	0.64	4	0.76	3	$266	28	9.9%	26	5.0%	33	$41,840	34	1.8%	22	18.5%	5	0.10%
Massachusetts	1	96.6	5	2.7%	1	38.9%	1	0.59	17	0.66	1	0.88	10	$240	8	12.4%	5	7.4%	4	$91,297	9	4.3%	15	19.5%	4	0.11%
Michigan	15	70.6	25	1.8%	19	30.3%	26	0.44	5	0.75	20	0.62	25	$216	32	9.3%	17	6.1%	16	$57,137	22	2.5%	44	15.9%	21	0.07%
Minnesota	12	72.6	5	2.7%	5	33.1%	8	0.52	21	0.63	13	0.67	15	$226	4	13.8%	32	4.5%	21	$51,660	26	2.4%	41	16.2%	12	0.08%
Mississippi	50	37.9	47	0.8%	49	25.0%	47	0.35	50	0.30	45	0.45	40	$192	47	6.1%	40	3.9%	35	$39,548	27	2.3%	41	16.2%	44	0.02%
Missouri	28	59.0	14	2.3%	23	29.7%	30	0.43	15	0.67	32	0.56	30	$212	16	11.3%	29	4.6%	29	$46,218	38	1.6%	14	19.7%	26	0.06%
Montana	43	49.1	44	1.0%	42	26.1%	21	0.46	4	0.79	22	0.60	34	$202	49	5.9%	50	1.9%	46	$31,456	44	0.9%	27	18.0%	44	0.02%
Nebraska	27	59.9	14	2.3%	27	28.8%	18	0.47	28	0.57	22	0.60	23	$220	10	12.1%	37	4.1%	25	$49,319	43	1.3%	19	19.0%	26	0.06%
Nevada	31	57.4	44	1.0%	50	21.7%	43	0.38	49	0.34	43	0.48	1	$302	39	8.2%	35	4.3%	6	$86,061	41	1.5%	1	22.3%	31	0.05%
N Hampshire	13	71.4	31	1.5%	14	30.8%	6	0.53	1	1.03	12	0.68	18	$223	25	10.2%	2	7.8%	32	$42,444	11	3.9%	20	18.7%	21	0.07%
New Jersey	8	77.6	9	2.6%	11	32.2%	8	0.52	13	0.68	8	0.73	38	$195	10	12.1%	4	7.5%	7	$85,849	15	3.3%	8	20.8%	12	0.08%
New Mexico	34	55.8	31	1.5%	27	28.8%	34	0.42	48	0.35	31	0.57	38	$195	45	6.5%	45	3.6%	39	$38,344	19	2.8%	11	20.0%	39	0.03%
New York	11	74.5	18	2.2%	3	33.6%	11	0.51	28	0.57	2	0.83	27	$214	1	15.1%	22	5.7%	3	$91,463	34	1.8%	25	18.3%	12	0.08%
North Carolina	22	65.6	20	2.1%	25	29.1%	23	0.45	38	0.52	18	0.63	12	$231	21	10.5%	8	7.2%	20	$53,032	16	3.0%	22	18.5%	12	0.08%
North Dakota	38	51.8	42	1.1%	47	25.6%	23	0.45	38	0.52	39	0.50	37	$201	43	7.4%	45	3.6%	43	$35,115	44	0.9%	9	20.7%	35	0.04%
Ohio	25	61.3	20	2.1%	21	29.8%	39	0.41	24	0.60	29	0.58	25	$216	14	11.5%	24	5.6%	28	$47,523	32	2.0%	48	15.4%	5	0.10%
Oklahoma	45	47.9	27	1.7%	29	28.6%	43	0.38	45	0.48	48	0.43	44	$183	34	8.8%	40	3.9%	37	$39,231	44	0.9%	26	18.1%	35	0.04%
Oregon	13	71.4	25	1.8%	14	30.8%	12	0.49	5	0.75	13	0.67	17	$224	17	11.0%	45	3.6%	23	$49,755	2	7.6%	29	17.6%	21	0.07%
Pennsylvania	23	64.4	20	2.1%	21	29.8%	26	0.44	36	0.53	13	0.67	20	$222	13	11.7%	18	6.0%	18	$54,939	30	2.1%	35	16.6%	12	0.08%
Rhode Island	20	66.7	14	2.3%	16	30.6%	12	0.49	32	0.55	9	0.71	43	$185	17	11.0%	6	7.3%	49	$25,620	38	1.6%	17	19.1%	35	0.04%
South Carolina	35	55.3	31	1.5%	43	26.0%	39	0.41	22	0.62	29	0.58	32	$206	34	8.8%	1	8.5%	11	$71,180	22	2.5%	29	17.6%	12	0.08%
South Dakota	41	49.5	36	1.4%	43	26.0%	34	0.42	17	0.66	50	0.39	40	$192	33	8.9%	43	3.8%	47	$27,914	48	0.6%	46	15.8%	39	0.03%
Tennessee	32	56.9	31	1.5%	36	27.2%	41	0.39	32	0.55	37	0.54	14	$228	36	8.6%	18	6.0%	24	$49,440	11	3.9%	29	17.6%	12	0.08%
Texas	17	67.5	20	2.1%	26	28.9%	34	0.42	42	0.51	18	0.63	7	$245	19	10.9%	22	5.7%	2	$111,491	3	6.5%	17	19.1%	5	0.10%
Utah	9	77.3	18	2.2%	17	30.5%	12	0.49	36	0.53	26	0.59	22	$221	14	11.5%	48	3.5%	26	$49,043	13	3.6%	4	22.0%	2	0.16%
Vermont	18	66.8	40	1.2%	12	31.5%	6	0.53	2	1.01	3	0.77	44	$183	46	6.4%	29	4.6%	17	$56,528	1	9.4%	36	16.5%	47	0.01%
Virginia	4	81.7	2	3.0%	7	32.5%	5	0.54	15	0.67	5	0.75	2	$267	6	13.0%	20	5.9%	19	$53,761	33	1.9%	11	20.0%	1	0.20%
Washington	3	84.5	1	4.2%	7	32.5%	8	0.52	8	0.73	13	0.67	11	$236	26	10.0%	36	4.2%	1	$156,266	7	4.4%	21	18.6%	12	0.08%
West Virginia	48	44.1	44	1.0%	35	27.3%	50	0.31	32	0.55	49	0.40	8	$243	47	6.1%	25	5.1%	34	$40,934	16	3.0%	43	16.1%	39	0.03%
Wisconsin	26	60.4	12	2.4%	30	28.5%	26	0.44	27	0.58	26	0.59	27	$214	22	10.4%	43	3.8%	38	$39,199	22	2.5%	38	16.3%	31	0.05%
Wyoming	47	47.1	50	0.6%	48	25.5%	30	0.43	3	0.93	45	0.45	48	$173	50	5.5%	40	3.9%	44	$33,574	21	2.6%	13	19.9%	47	0.01%
U.S. Average	-	62.7	-	2.1%	-	30.3%	-	0.46	-	0.59	-	0.63	-	$218	-	11.3%	-	5.5%	-	$68,446	-	3.2%	-	19.0%	-	0.08%

	Initial Public Offerings		Inventor Patents		Online Agriculture		E-Government		Broadband Telecommunications		Health IT		High-Tech Jobs		Scientists and Engineers		Patents		Industry Investment in R&D		Non-Industry Investment in R&D		Movement Toward a Green Economy		Venture Capital	
State	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
AL	38	4.40	46	0.033	45	3.77	43	83	47	3.61	22	5.15	30	4.0%	26	2.9%	48	2.2	39	0.5%	4	1.3%	41	4.63	32	0.02%
AK	41	4.25	22	0.065	28	4.74	47	80	38	4.38	6	5.69	27	4.1%	30	2.7%	47	2.6	47	0.2%	29	0.4%	3	5.64	43	0.00%
AZ	19	5.11	12	0.090	47	3.57	21	90	33	4.66	41	4.43	16	4.8%	10	3.7%	16	13.6	12	1.6%	19	0.5%	25	4.97	19	0.07%
AR	41	4.25	49	0.026	35	4.36	21	90	49	3.34	12	5.37	48	2.4%	43	1.8%	49	1.8	46	0.3%	42	0.3%	34	4.79	34	0.01%
CA	8	5.58	2	0.142	14	5.76	11	93	21	5.21	30	5.01	5	6.8%	7	4.3%	13	14.6	3	2.5%	10	0.7%	30	4.90	1	1.28%
CO	5	6.19	5	0.104	17	5.56	11	93	38	4.38	18	5.22	7	6.6%	4	4.9%	6	17.0	15	1.3%	10	0.7%	13	5.30	7	0.22%
CT	2	6.91	9	0.099	1	6.65	11	93	13	5.68	45	4.21	18	4.7%	10	3.7%	11	15.5	5	2.0%	29	0.4%	43	4.53	15	0.08%
DE	41	4.25	45	0.040	25	4.79	35	87	1	6.45	29	5.02	15	5.0%	14	3.4%	1	24.5	1	4.1%	42	0.3%	38	4.75	19	0.07%
FL	25	4.75	13	0.088	23	4.97	11	93	25	5.04	11	5.38	34	3.7%	36	2.1%	14	14.5	25	0.9%	29	0.4%	19	5.12	10	0.13%
GA	24	4.83	33	0.054	36	4.34	6	97	27	4.93	26	5.07	24	4.2%	22	3.1%	32	7.3	25	0.9%	19	0.5%	11	5.33	8	0.16%
HI	14	5.20	36	0.050	28	4.74	21	90	36	4.64	50	3.18	48	2.4%	46	1.7%	15	14.2	25	0.9%	14	0.6%	3	5.64	43	0.00%
ID	6	6.16	19	0.074	16	5.59	21	90	45	3.83	43	4.34	12	5.5%	33	2.5%	8	16.2	13	1.5%	7	1.0%	22	5.10	43	0.00%
IL	22	4.89	23	0.064	20	5.50	11	93	26	5.02	18	5.22	24	4.2%	18	3.2%	20	10.9	8	1.8%	19	0.5%	35	4.78	9	0.14%
IN	40	4.36	36	0.050	31	4.64	6	97	28	4.87	13	5.36	27	4.1%	33	2.5%	41	5.4	16	1.2%	29	0.4%	42	4.61	32	0.02%
IA	35	4.48	33	0.054	17	5.56	21	90	37	4.47	32	4.94	35	3.6%	35	2.4%	40	5.5	25	0.9%	19	0.5%	16	5.16	34	0.01%
KS	16	5.16	29	0.060	32	4.62	50	77	34	4.65	48	4.00	32	3.9%	25	3.0%	35	6.5	31	0.8%	29	0.4%	1	6.29	34	0.01%
KY	21	4.93	48	0.029	44	3.85	21	90	41	4.19	33	4.86	38	3.2%	42	1.9%	45	3.1	36	0.6%	42	0.3%	8	5.46	25	0.05%
LA	37	4.44	39	0.046	40	4.03	43	83	46	3.65	46	4.16	44	2.6%	43	1.8%	44	3.5	47	0.2%	42	0.3%	9	5.37	34	0.01%
ME	41	4.25	43	0.041	1	6.65	21	90	19	5.29	40	4.57	41	3.0%	41	2.0%	29	8.4	31	0.8%	29	0.4%	6	5.57	34	0.01%
MD	12	5.28	14	0.086	25	4.79	21	90	5	6.23	2	6.08	8	6.1%	5	4.8%	17	13.0	25	0.9%	2	4.1%	14	5.25	15	0.08%
MA	3	6.78	4	0.111	1	6.65	21	90	10	5.91	4	5.84	1	7.9%	3	5.1%	9	15.7	4	2.1%	3	1.4%	10	5.35	2	1.27%
MI	28	4.66	16	0.079	28	4.74	1	100	12	5.81	13	5.36	13	5.4%	6	4.4%	4	17.1	2	3.0%	14	0.6%	32	4.88	25	0.05%
MN	38	4.40	7	0.102	19	5.53	11	93	15	5.55	8	5.40	14	5.3%	8	3.9%	3	17.5	8	1.8%	29	0.4%	37	4.76	12	0.10%
MS	41	4.25	50	0.021	49	3.49	21	90	50	3.17	22	5.15	40	3.1%	50	1.2%	50	1.3	47	0.2%	8	0.8%	30	4.90	43	0.00%
MO	34	4.50	42	0.043	38	4.28	1	100	40	4.32	37	4.71	30	4.0%	26	2.9%	38	6.0	13	1.5%	29	0.4%	46	4.46	15	0.08%
MT	41	4.25	20	0.071	10	5.84	35	87	30	4.79	38	4.67	44	2.6%	43	1.8%	21	10.8	44	0.4%	14	0.6%	22	5.10	30	0.03%
NE	33	4.51	26	0.062	12	5.79	21	90	20	5.23	30	5.01	37	3.5%	26	2.9%	33	7.1	36	0.6%	29	0.4%	28	4.93	30	0.03%
NV	4	6.30	5	0.104	47	3.57	43	83	23	5.08	28	5.06	47	2.5%	49	1.4%	4	17.1	20	1.0%	50	0.1%	19	5.12	19	0.07%
NH	32	4.58	3	0.114	1	6.65	35	87	16	5.44	36	4.79	3	7.1%	12	3.6%	24	9.8	31	0.8%	19	0.5%	40	4.64	19	0.07%
NJ	22	4.89	11	0.092	7	6.20	43	83	9	5.95	34	4.80	9	5.6%	8	3.9%	2	19.5	7	1.9%	42	0.3%	19	5.12	19	0.07%
NM	36	4.45	32	0.055	50	3.41	35	87	48	3.46	16	5.25	2	7.3%	18	3.2%	7	16.9	39	0.5%	1	5.8%	35	4.78	34	0.01%
NY	8	5.58	15	0.081	24	4.85	21	90	14	5.59	1	6.51	24	4.2%	29	2.8%	9	15.7	25	0.9%	19	0.5%	43	4.53	3	0.52%
NC	16	5.16	39	0.046	27	4.77	11	93	28	4.87	20	5.18	9	5.6%	18	3.2%	36	6.3	20	1.0%	10	0.7%	15	5.24	11	0.12%
ND	30	4.64	30	0.057	12	5.79	6	97	18	5.31	10	5.39	41	3.0%	36	2.1%	39	5.8	36	0.6%	19	0.5%	49	4.01	43	0.00%
OH	25	4.75	23	0.064	34	4.39	1	100	34	4.65	8	5.40	35	3.6%	16	3.3%	23	9.9	18	1.1%	19	0.5%	28	4.93	27	0.04%
OK	20	4.97	36	0.050	33	4.46	35	87	43	4.07	15	5.33	43	2.7%	36	2.1%	42	5.1	44	0.4%	42	0.3%	11	5.33	43	0.00%
OR	41	4.25	10	0.097	8	6.07	21	90	7	6.02	25	5.11	9	5.6%	22	3.1%	24	9.8	5	2.0%	29	0.4%	7	5.53	14	0.09%
PA	11	5.37	33	0.054	43	3.87	11	93	3	6.42	39	4.63	21	4.4%	22	3.1%	28	8.5	10	1.7%	14	0.6%	48	4.05	12	0.10%
RI	1	8.76	23	0.064	1	6.65	47	80	2	6.44	42	4.36	21	4.4%	18	3.2%	26	9.7	20	1.0%	4	1.3%	50	3.84	27	0.04%
SC	41	4.25	43	0.041	41	3.96	35	87	32	4.71	49	3.99	27	4.1%	32	2.6%	33	7.1	39	0.5%	19	0.5%	24	5.00	34	0.01%
SD	18	5.13	16	0.079	21	5.28	35	87	17	5.40	34	4.80	38	3.2%	36	2.1%	36	6.3	39	0.5%	42	0.3%	26	4.95	43	0.00%
TN	14	5.20	39	0.046	42	3.95	11	93	24	5.06	7	5.41	33	3.8%	36	2.1%	43	4.2	39	0.5%	8	0.8%	27	4.94	24	0.06%
TX	7	5.64	21	0.067	37	4.29	21	90	42	4.12	21	5.16	21	4.4%	13	3.5%	30	7.9	20	1.0%	29	0.4%	33	4.85	15	0.08%
UT	10	5.42	1	0.169	15	5.61	1	100	6	6.13	24	5.14	6	6.7%	14	3.4%	21	10.8	16	1.2%	14	0.6%	39	4.65	5	0.43%
VT	13	5.22	16	0.079	1	6.65	35	87	21	5.21	44	4.27	18	4.7%	30	2.7%	19	11.9	20	1.0%	29	0.4%	2	6.22	34	0.01%
VA	28	4.66	31	0.056	39	4.18	1	100	4	6.34	3	5.85	16	4.8%	2	5.2%	31	7.5	35	0.7%	6	1.1%	17	5.15	4	0.45%
WA	27	4.68	8	0.100	11	5.82	6	97	8	5.96	5	5.72	4	6.9%	1	5.4%	18	12.5	10	1.7%	10	0.7%	5	5.63	6	0.00%
WV	41	4.25	46	0.033	46	3.64	11	93	31	4.72	47	4.10	44	2.6%	48	1.5%	46	3.0	31	0.8%	29	0.4%	47	4.27	34	0.01%
WI	31	4.59	26	0.062	22	5.10	6	97	11	5.90	26	5.07	20	4.5%	16	3.3%	27	9.0	18	1.1%	19	0.5%	45	4.50	27	0.04%
WY	41	4.25	26	0.062	9	5.99	47	80	44	3.85	17	5.24	48	2.4%	46	1.7%	12	14.9	50	0.1%	49	0.2%	18	5.14	43	0.00%
U.S.	-	5.00	-	0.079	-	5.00	-	90	-	5.00	-	5.00	-	4.8%	-	3.4%	-	10.3	-	1.5%	-	0.7%	-	5.00	-	0.33%

SUMMARY OF RESULTS

There has been little movement among the top states since ITIF published the 2014 edition of the *Index.* Massachusetts continues to occupy first place, as it has in the previous seven editions. California and Washington both have moved up one position from 2014 to second and third place, respectively. Virginia has moved up three positions to fourth place, while Delaware has slipped three positions to fifth.

There are several reasons why Massachusetts continues to be the state whose economic structure best matches the realities of the New Economy. Boasting a concentration of software, hardware, and biotech firms that are supported by world-class universities such as MIT and Harvard, Massachusetts survived the economic downturn of the early 2000s and later was less affected than the nation as a whole during the Great Recession in terms of its job growth and per-capita income growth. Its high standard of living may also contribute to its ability to attract scientists, engineers, and other skilled migrants in high-wage high-tech jobs.

Second-ranked California meanwhile thrives on indicators of innovation capacity, due in no small part to Silicon Valley and high-tech clusters in Southern California. The state also continues to dominate in venture capital, receiving 55 percent of U.S. venture investments, and it scores extremely well across the board on indicators of research and development (R&D), patents, entrepreneurship, and the skills of its workforce.[2] Washington State, in third place, ranks in the top five not only because of its strength in software and aviation exports, but also because of the entrepreneurial activity that has developed in the Puget Sound region and the widespread use of digital technologies by all sectors. Virginia comes in fourth with some of the fastest-growing companies in the country, and its proximity to the nation's capital attracts high-skilled workers for the numerous R&D-focused firms in the region. Fifth-place Delaware is perhaps the most globalized of states, with business-friendly corporate law that attracts both domestic and foreign companies and supports a high-wage traded service sector.

Maryland, Colorado, New Jersey, Utah, and Connecticut complete the top 10 in the 2017 *Index.* Sixth-ranked Maryland holds its place among the leaders primarily because it has a high concentration of knowledge workers, many employed with the federal government or with federal contractors in the suburbs of Washington, D.C. Colorado, in seventh place, maintains a highly dynamic economy along with the third-most highly educated workforce in the country. In addition to its high scores on knowledge-employment indicators, the state also has become a hotbed for high-tech innovation in the middle of the country, and it scores well on initial public offerings. Eighth-place New Jersey's strong pharmaceutical industry, coupled with high-tech agglomeration around Princeton, an advanced services sector in Northern New Jersey, and high levels of foreign direct investment, helped push it up two spots in this year's ranking. Coming in ninth, Utah leads in economic dynamism assisted by its strong high-tech manufacturing cluster centered in Salt Lake City and Provo, and its ability to attract venture capital. Connecticut rounds out the top 10 by exceling in traded services, employing a highly educated workforce, and receiving high levels of foreign direct investment and R&D.

In general, these top 10 New Economy states have more in common than just high-tech firms. They also tend to have a high concentration of managers, professionals, and technical jobs, tend to attract college-educated residents working in "knowledge jobs" (jobs that require at least a two-year degree), have thriving traded service industries that pay well, and are home to firms that experience immense growth. In fact, the variable that is most closely correlated with a high overall ranking (0.87) is scientists and engineers. With one or two exceptions, companies in these 10 states tend to be more geared toward global markets, both in terms of export orientation and the amount of foreign direct investment. Almost all are at the forefront of the IT revolution, with a large share of their institutions and residents embracing the digital economy. Most have a solid "innovation infrastructure" that fosters and supports technological innovation. Many attract high levels of domestic and foreign immigration of highly mobile, highly skilled knowledge workers seeking good employment opportunities and a high quality of life.

While top-ranked states tend to be richer (there is a moderate correlation of 0.54 between overall rank and per-capita income), wealth is not a simple determinant of states' progress in adapting to the New Economy, as not all forms of income contribute to a place in the New Economy.[3] In particular, resource-dependent Wyoming, North Dakota, and Alaska lag behind in their scores. In fact, Alaska and Wyoming score in the bottom 10 overall, despite scoring in the top 10 when it comes to per capita income. In contrast, Arizona, Idaho, Utah, Michigan, and Florida fair significantly better in the *New Economy Index* than would be expected solely by their per-capita incomes.

The two states whose economies have lagged the most in making the transition to the New Economy are Mississippi and Arkansas. West Virginia, Wyoming, Louisiana, Oklahoma, Alabama, Montana, Alaska, and South Dakota round out the bottom 10. This group looks almost identical to the bottom 10 in the 2014 *Index*, with only Montana and Alaska as the two new additions. Historically, the economies of many of these states have depended on natural resources, tourism, or mass-production manufacturing; low costs of doing business rather than innovative capacity was their source of competitive advantage. In the New Economy, however, innovative capacity (derived through universities, R&D investments, scientists and engineers, highly skilled workers, and entrepreneurial capabilities) is increasingly the driver of competitive success, while states only offering low costs are being undercut by cheaper producers abroad.

Regionally, the New Economy has taken hold most strongly in the Northeast, the Mid-Atlantic, the Mountain states, and the Pacific region. Indeed, the top 15 states in this year's *Index* include all three Pacific-coast states, three of four Mid-Atlantic states (plus south-Atlantic states Maryland and Virginia), and three of six New England states. To that group, the Mountain states add Colorado and Utah. Meanwhile, a resurgent Midwest adds Minnesota and Michigan. On the other end of the spectrum, 16 of the 20 lowest-ranking states are in the Midwest, the Mountain states, and the South (the exceptions being Maine, Alaska, Hawaii, and West Virginia).

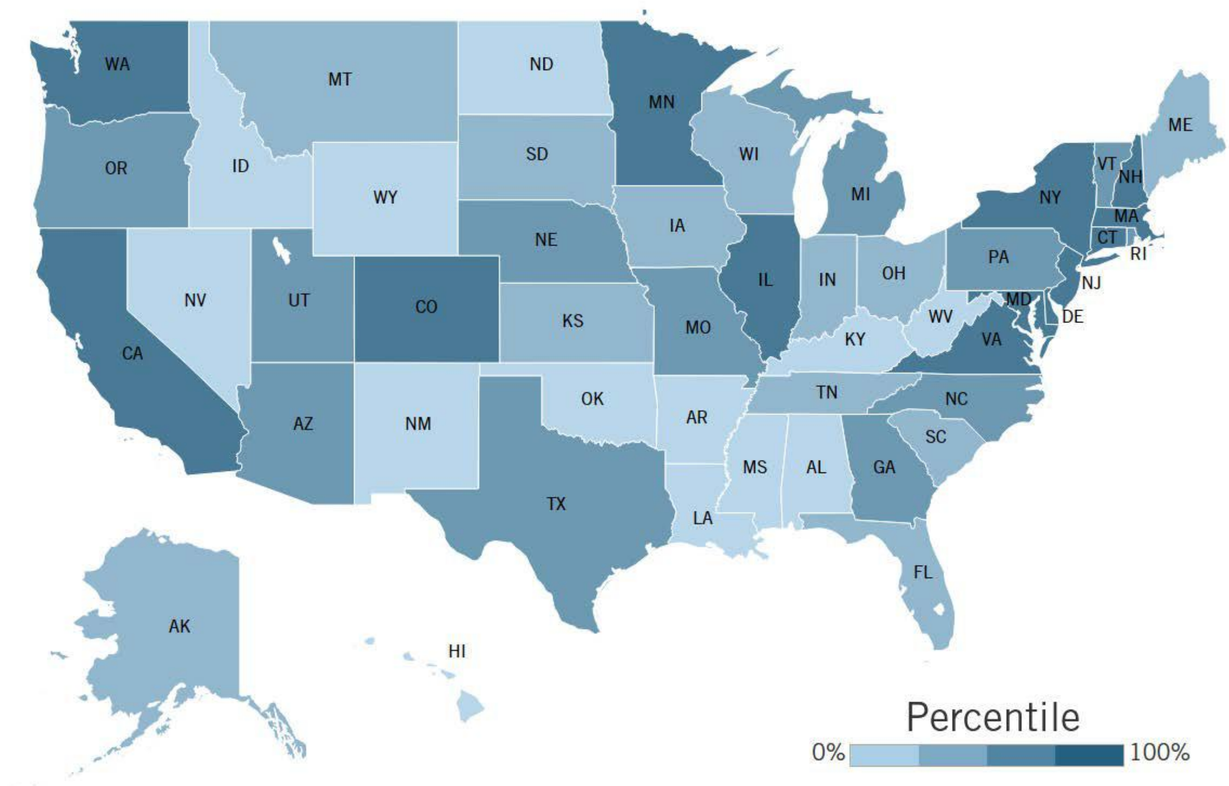
Given some states' reputations as technology-based, New Economy states, their scores may at first seem surprising. For example, North Carolina and New Mexico rank in the middle—at 22nd and 33rd, respectively—in spite of the fact that the region around Research Triangle Park boasts top universities, a highly educated workforce, cutting-edge technology companies, and global connections, while Albuquerque and Los Alamos are home to two leading national laboratories. In both cases, however, many parts of the state outside these metropolitan regions are more rooted in the industrial-age economy, with more jobs in traditional manufacturing, agriculture, and lower-skilled services; a less-educated workforce; and a less-developed innovation infrastructure. As these examples reveal, most state economies are in fact composites of many regional economies that differ in the degree to which they are structured to align with New Economy factors.

Previous editions of the *State New Economy Index* have found strong correlations between states' overall scores and their per capita GDP growth. But the natural resources boom following the Great Recession has reduced this relationship, producing big income gains in lower-scoring states such as the Dakotas and Wyoming while higher-scoring states such as California have seen incomes languish under the aftereffects of the nationwide real estate bust. Still, in the wake of the Great Recession, states that have embraced New Economy fundamentals have prospered. There is a positive correlation of 0.5 between states' overall scores in the 2017 *Index* and their real per capita income growth from 2013 to 2016. Indeed, states that embrace the tenets of the New Economy should see their productivity growth increase from the nation's recent sluggish pace (U.S. productivity grew only 4 percent from 2011 to 2016, as compared to 12 percent from 2001 to 2006). That, in turn, should generate greater per-capita GDP growth and higher living standards.[4]

KNOWLEDGE JOBS

In the old economy, workers who were skilled with their hands and could reliably perform repetitive, sometimes physically demanding tasks were the engines of growth. Today, it is knowledge-based jobs that drive prosperity. These jobs tend to be managerial, professional, and technical positions that require at least two years of college. Such skilled and educated workers are key enablers of states' most important industries, from high-value-added manufacturing to high-wage traded services.

The "knowledge jobs" indicators in this report measure seven aspects of knowledge-based employment: 1) employment in IT occupations in non-IT sectors; 2) the share of the workforce employed in managerial, professional, and technical occupations; 3) the education level of the workforce; 4) the average educational attainment of recent immigrants; 5) the average educational attainment of recent U.S. inter-state migrants; 6) worker productivity in the manufacturing sector; and 7) employment in high-wage traded services.

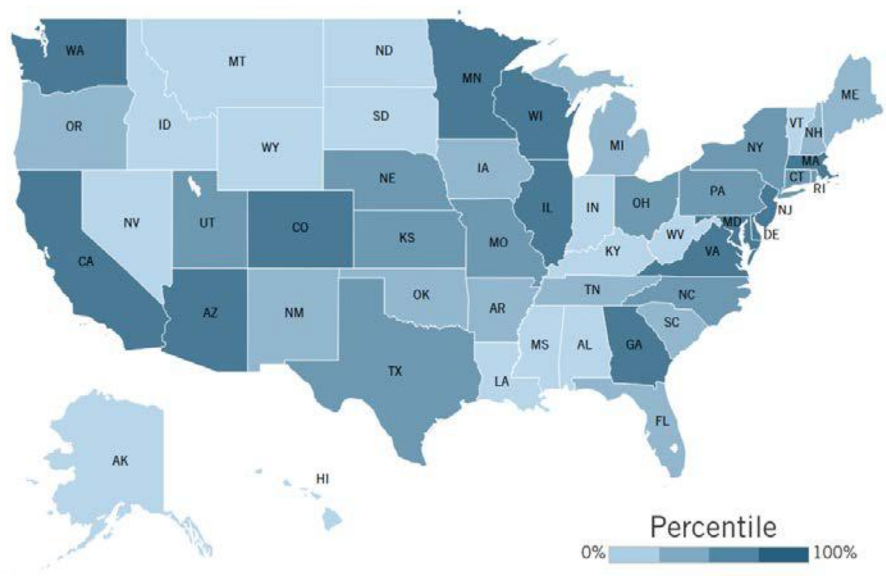


2017 Rank	State	2017 Score	2014 Rank*	2017 Rank	State	2017 Score	2014 Rank*
1	Massachusetts	18.3	1	26	Wisconsin	10.1	30
2	Connecticut	16.6	4	27	Ohio	10.0	25
3	Virginia	16.4	2	28	Iowa	9.8	31
4	Maryland	15.7	3	29	Kansas	9.5	27
5	Washington	15.4	7	30	Maine	8.9	32
6	Colorado	15.2	6	31	Florida	8.5	38
7	New York	14.8	9	32	Montana	7.5	36
8	Minnesota	14.7	8	33	South Carolina	7.4	34
9	Delaware	14.4	5	33	Tennessee	7.4	40
10	New Jersey	13.6	10	35	Alaska	6.9	28
11	California	13.5	12	35	Indiana	6.9	41
11	Illinois	13.5	14	37	South Dakota	6.6	44
13	New Hampshire	13.2	15	38	New Mexico	6.4	19
14	Oregon	12.3	11	38	North Dakota	6.4	33
15	Utah	11.5	13	40	Oklahoma	6.1	42
15	Vermont	11.5	16	40	Louisiana	6.1	43
17	Rhode Island	11.3	18	40	Idaho	6.1	35
18	Nebraska	11.2	17	43	Alabama	6.0	37
19	Georgia	11.1	24	43	Nevada	6.0	48
20	Arizona	10.8	20	45	Hawaii	5.7	39
20	Pennsylvania	10.8	23	45	Arkansas	5.7	45
22	North Carolina	10.5	21	47	Kentucky	5.6	47
23	Missouri	10.4	22	48	Wyoming	5.4	46
23	Texas	10.4	29	49	West Virginia	4.7	49
25	Michigan	10.3	26	50	Mississippi	2.6	50
					U.S. Average	10.0	

**Due to methodological changes, ranking comparisons are not exact*

INFORMATION TECHNOLOGY JOBS

IT jobs in non-IT industries as a share private-non-IT-sector employment



"IT jobs grew by 35 percent between 2006 and 2016, versus only 6 percent for employment in general."

Why is this important? Information technology continues to transform the economy, as businesses in all industries use IT to find new ways to boost productivity, develop new products and services, and create new business models. The number of IT workers in non-IT industries is a good proxy to measure the extent to which non-IT industries are making use of IT.

IT workers, even in "traditional" industries, are bringing IT to an ever-growing list of applications, from e-commerce, to streamlining internal office operations, to finding new ways to communicate with customers, to finding and acting on new insights in data. In fact, because of the continuing digital transformation of the economy, IT jobs grew by 35 percent between 2006 and 2016, versus only 6 percent for private-sector employment in general.[5]

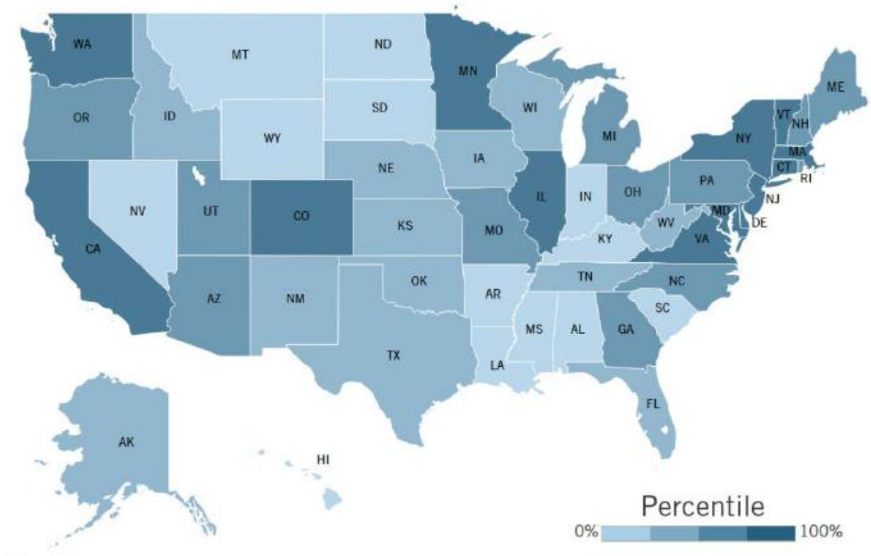
The rankings: Even after adjusting for the size of states' software and IT-producing industries, most of the states with high scores are those with more technology-driven economies, including every one of the top five. In these states, the creation of strong IT-producing industries leads to complementary job creation in non-IT fields. Arizona is one example. A rapidly growing tech start-up ecosystem has helped add IT jobs in other sectors of its economy and could explain how this state jumped 15 positions in the rankings over the past seven years to round off the top-five for this indicator.

	The Top Five	Percentage of IT Jobs in Non-IT Industries
1	Washington	4.2%
2	Virginia	3.0%
3	Colorado	2.9%
4	Delaware	2.8%
5	Arizona	2.7%
	U.S. Average	2.1%

Source: Bureau of Labor Statistics, 2016

MANAGERIAL, PROFESSIONAL, AND TECHNICAL JOBS

Managerial, professional, and technical jobs as a share of private-sector employment



"Managerial, professional, and technical jobs grew nearly three times faster than overall private-sector employment between 2006 and 2016."

Why is this important? As the economy grows ever more knowledge-based and many routine-based jobs are either moved offshore or automated, managers, professionals and technicians are becoming more important. Indeed, these jobs grew nearly three times faster than overall private-sector employment between 2006 and 2016, with 17 percent growth over the period versus 6 percent growth for private-sector jobs overall.[6] These jobs include scientists and engineers, health professionals, lawyers, teachers, accountants, bankers, consultants, and engineering technicians.

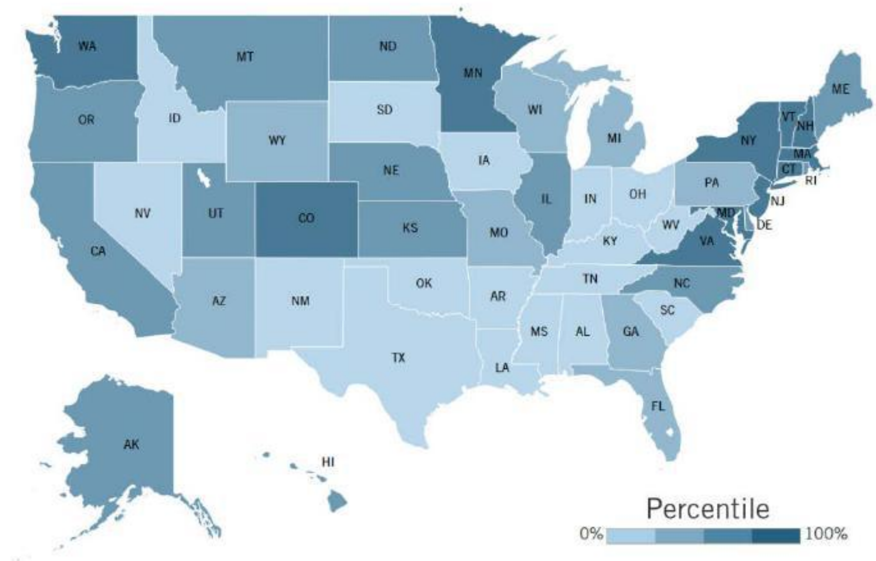
The rankings: States with the highest rankings—Massachusetts, Connecticut, New York, Maryland, and Minnesota—tend to have more technology and professional service companies and corporate headquarters or regional offices. Massachusetts's large biotech, financial services, higher education, and health care industries are responsible for the state's lead. In Connecticut, Hartford is home to insurance and defense headquarters, while southwestern Connecticut is dominated by corporate headquarters, financial services and high-tech jobs—many of which have relocated from New York City. While this may have hurt New York slightly, it is still home to more than one-tenth of *Fortune 500* companies.[7] Maryland ranks high in part because of the high number of federal contractors located in "next-door" Washington, D.C. States that rank poorly tend to be either "branch-plant" and "back-office" states such as Nevada and Mississippi, or natural-resource-based states such as Wyoming and North Dakota.

	The Top Five	Percentage of Jobs Held by Managers, Professionals, and Technicians
1	Massachusetts	38.9%
2	Connecticut	34.7%
3	New York	33.6%
4	Maryland	33.4%
5	Minnesota	33.1%
	U.S. Average	30.3%

Source: Bureau of Labor Statistics, 2016

WORKFORCE EDUCATION

A weighted score of the working age adult population's educational attainment



"In 2016, 33 percent of Americans over 25 years of age held at least a bachelor's degree, up from 30 percent in 2010, and 24 percent in 2000."

Why is this important? An educated workforce is important to increasing productivity and fostering innovation. Fortunately, the American workforce has become more educated (at least in terms of number of years of schooling). In 2016, 33 percent of Americans over 25 years of age held at least a bachelor's degree, up from 30 percent in 2010, 24 percent in 2000, 21 percent in 1990, and 16 percent in 1980.[8] Unfortunately, it's increasingly clear that many of these graduates are failing to gain the competencies they need.[9] For example, four out of ten college graduates made no progress on the Collegiate Learning Assessment between the time they entered college and when they graduated.[10] This suggests that states need to focus more on boosting quality rather than just boosting access.[11]

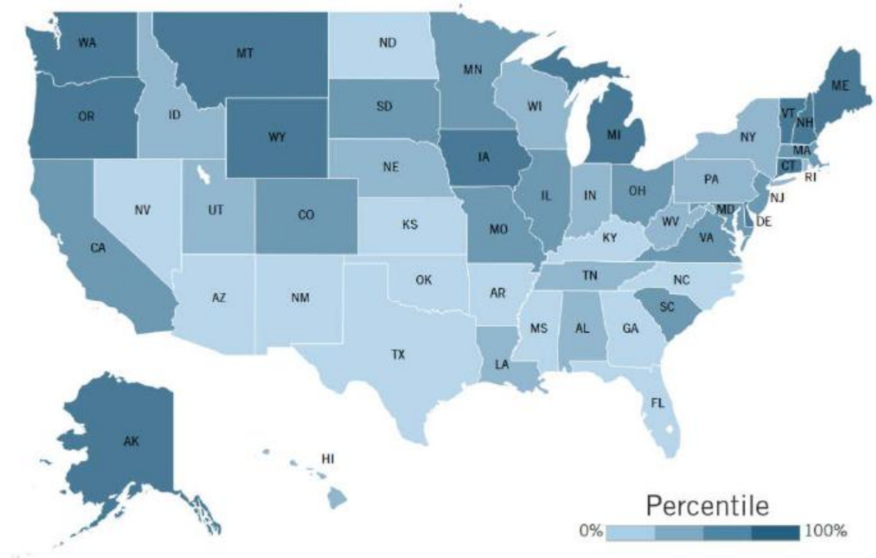
The rankings: States with strong higher education systems and high-tech industrial clusters, such as Massachusetts, Maryland, and Connecticut, tend to attract and retain skilled workers. Colorado attracts individuals from other regions who, on average, have more years of schooling than those heading to other fast-growing western states. Likewise, Maryland and Virginia are sustained, in part, by the immigration of highly educated individuals to the Washington, D.C. area.[12] Meanwhile, those states that have historically invested less in education (like Alabama, Louisiana, Mississippi, and Arkansas) and whose economies are more cost-based, tend to fall near the bottom of this ranking.

	The Top Five	Composite Score
1	Massachusetts	0.59
2	Maryland	0.56
3	Colorado	0.56
4	Connecticut	0.55
5	Virginia	0.54
	U.S. Average	0.46

Source: Census Bureau, 2015

IMMIGRATION OF KNOWLEDGE WORKERS

A weighted score of the foreign-born migrant population's educational attainment



> *"A third of U.S. innovators were born outside the country even though immigrants only represent 13.5 percent of all U.S. residents."*

Why is this important? To compete in the highly competitive global economy, states need a supply of talented labor with the right skills and education. And in a world with ever-increasing flows of talent across national borders, an important share of this talent pool is coming from overseas. In many cases, these workers do more than merely fill occupational gaps; by bringing new ideas and perspectives from other countries and cultures, they can enhance states' innovation capacity and boost wage levels for both themselves and for native-born workers.[13] ITIF found in a 2016 study titled *The Demographics of Innovation in the United States* that more than a third of the scientists and engineers producing meaningful innovations in the United States were born outside the country even though immigrants only represent 13.5 percent of all U.S. residents.[14] While immigrants play an outsized role in developing innovations, they also nurture future innovators. In the same study, ITIF finds that 10 percent of U.S.-born innovators have at least one immigrant parent.

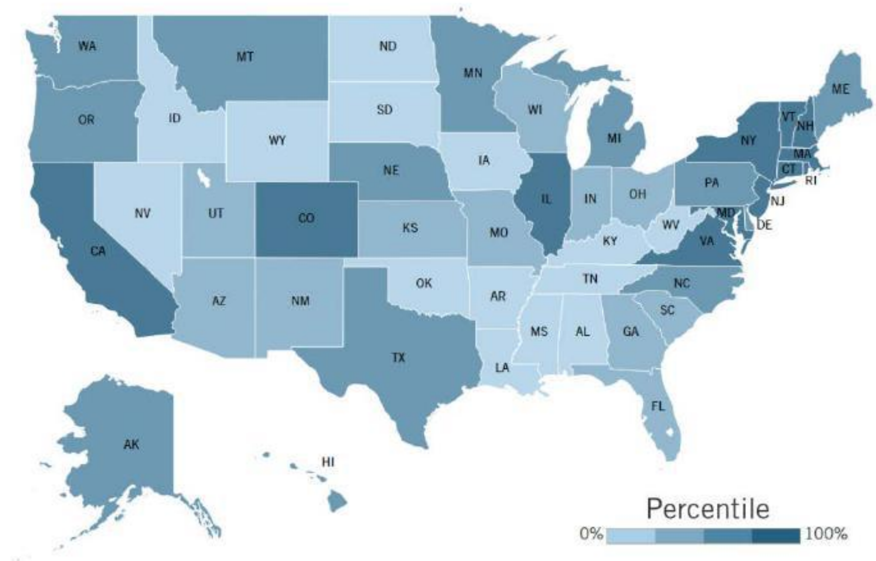
The rankings: It is not clear why some states outperform others. One factor may be that leading states have fewer lower-skilled immigrants from Latin America. All five leading states are relatively far north and relatively far from the Mexican border. In these states, immigrants without a college degree make up less than 25 percent of the immigrant talent pool, 10 percentage points less than the national average.

	The Top Six	Composite Score
1	New Hampshire	1.03
2	Vermont	1.01
3	Wyoming	0.93
4	Montana	0.79
5	Michigan	0.75
5	Oregon	0.75
	U.S. Average	0.59

Source: Census Bureau, 2015

INTERNAL MIGRATION OF U.S. KNOWLEDGE WORKERS

A weighted score of educational attainment of migrant population from other U.S. states



"A 1 percent increase in the supply of college graduates increases all high school dropouts' wages by 1.6 percent and all college graduates' wages by 0.4 percent."

Why is this important? Just as countries compete for talent, so do states. While foreign immigration of highly skilled workers is important, especially those in science, technology, math, and engineering fields, the lion's share of immigration into states involves American residents moving across state lines. Accordingly, states compete with one another not only to attract business, but also to attract the skilled workers who can work for those businesses or start their own. Indeed, research has found that a 1 percent increase in a metropolitan area's level of educational attainment leads to a 0.04 increase in per-capita real income, and that a 1 percent increase in the supply of college graduates increases high school dropouts' wages by 1.6 percent and all college graduates' wages by 0.4 percent.[15]

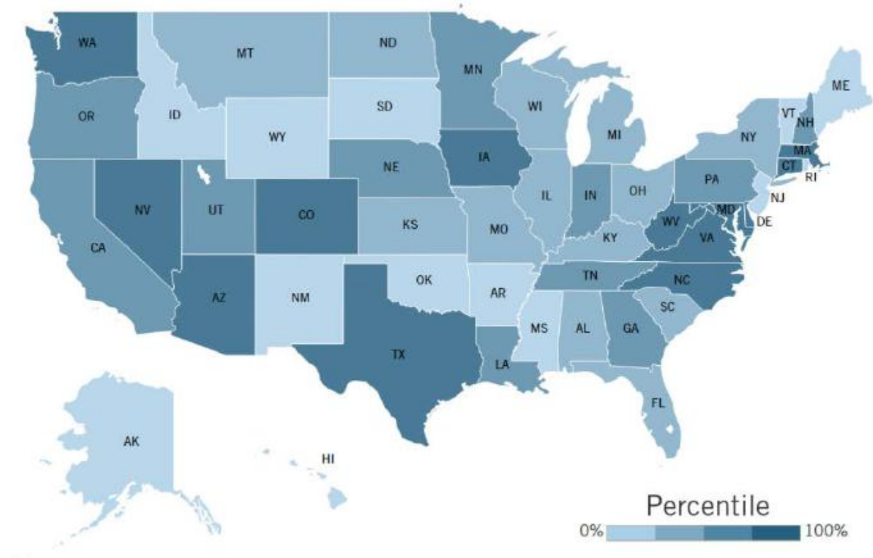
The rankings: There appear to be several factors driving internal immigration of U.S. knowledge workers. States with a large share of scientists and engineers, such as Massachusetts and California, do well on this indicator.[16] Strong higher education systems in Massachusetts and New York contributed to their high ranks, while highly educated workers moving to government and government-related jobs in the Washington, D.C. area helped Virginia and Maryland into the top five. In addition, quality of outdoor life appears to play a key role, with states like Vermont, New Hampshire, Washington, Oregon, and Hawaii all scoring well.

	The Top Six	Composite Score
1	Massachusetts	0.88
2	New York	0.83
3	Vermont	0.77
4	Maryland	0.76
5	California	0.75
5	Virginia	0.75
	U.S. Average	0.63

Source: Census Bureau, 2015

MANUFACTURING VALUE ADDED

Manufacturing value added per production hour worked, adjusted for industry mix



"States that are pro-business tend to not only have highly productive manufacturing sectors, they are also home to higher concentrations of fast-growing businesses."

Why is this important? Value added is the difference in value between inputs into the production process (such as materials and energy) and the value of final products or services sold. Within manufacturing, high-value-added firms tend to be those that are capital-intensive, producing more technologically complex products, and organizing their work to take better advantage of worker skills. Because their workers are more productive—generating greater value for each hour worked—they typically pay higher wages.[17] Within sectors, firms with higher-value-added levels, all else being equal, are better equipped to meet competitive challenges both at home and abroad.

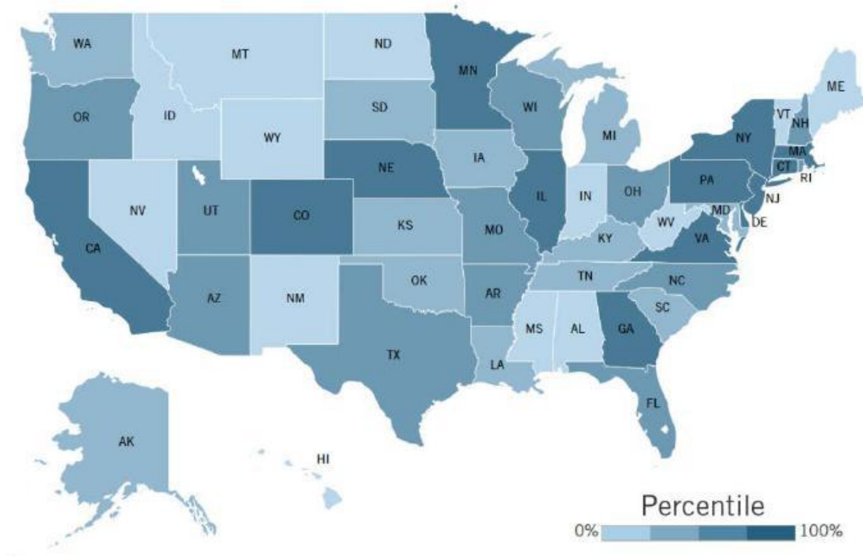
The rankings: It is not clear what factors lead states to rank highly on this indicator. Geography does not seem to have significant impact on how states performed. States clustered around the U.S. capital make up three of the top five states, while the top ten states range from the East to West coast. Of the six New England states, two made the top ten while three made the bottom ten. All three Pacific Coast states performed above average. But the Mountain states, states in the Midwest, and southern states occupy various positions across the rankings. Alaska and Hawaii, states not known for manufacturing, occupy the last two positions.

	The Top Five	Value Added per Production Hour Worked
1	Nevada	$302
2	Virginia	$267
3	Maryland	$266
4	Delaware	$249
5	Iowa	$247
	U.S. Average	$218

Source: Census Bureau, 2015

HIGH-WAGE TRADED SERVICES

Employment in traded service sectors that pay above the national median service-sector wage as a share of service-sector employment



"Traded services accounted for 19 percent of U.S. private-sector employment in 2015."

Why is this important? The service sector consists of more than just locally focused, low-wage industries like fast food. From insurance and financial services to publishing and goods transportation, traded services accounted for 19 percent of U.S. private-sector employment in 2015.[18] Many of these industries, like investment services, publishing, legal services, advertising, and shipping, pay wages above the national average. High-wage traded services have rebounded from the economic recession and have become a significant source of employment. For example, employment in professional and business services grew at 3.2 percent annually from 2010 to 2015, 1 percentage point faster than private sector employment.[19] We can expect this trend to continue as the IT revolution is enabling a growing share of information-based services to be physically distant from customers while remaining functionally close. For example, the Internet has transformed services like banking and retail from locally focused industries into globally competitive ones.

The rankings: Large, traditional centers of business activity lead the rankings here. The New York and Chicago metropolitan areas are home to a wide array of corporate or regional headquarters, financial services firms, and publishers. Delaware has long focused on attracting banking and credit card firms. Connecticut is home to many insurance companies. States ranking poorly, such as Wyoming, Montana, and West Virginia, tend to be economies more heavily based on resource-dependent industries and traditional manufacturing.

	The Top Five	Percentage of Service Jobs in High-Wage Traded Sectors
1	New York	15.1%
2	Delaware	14.8%
3	Connecticut	14.7%
4	Minnesota	13.8%
5	Illinois	13.5%
	U.S. Average	11.3%

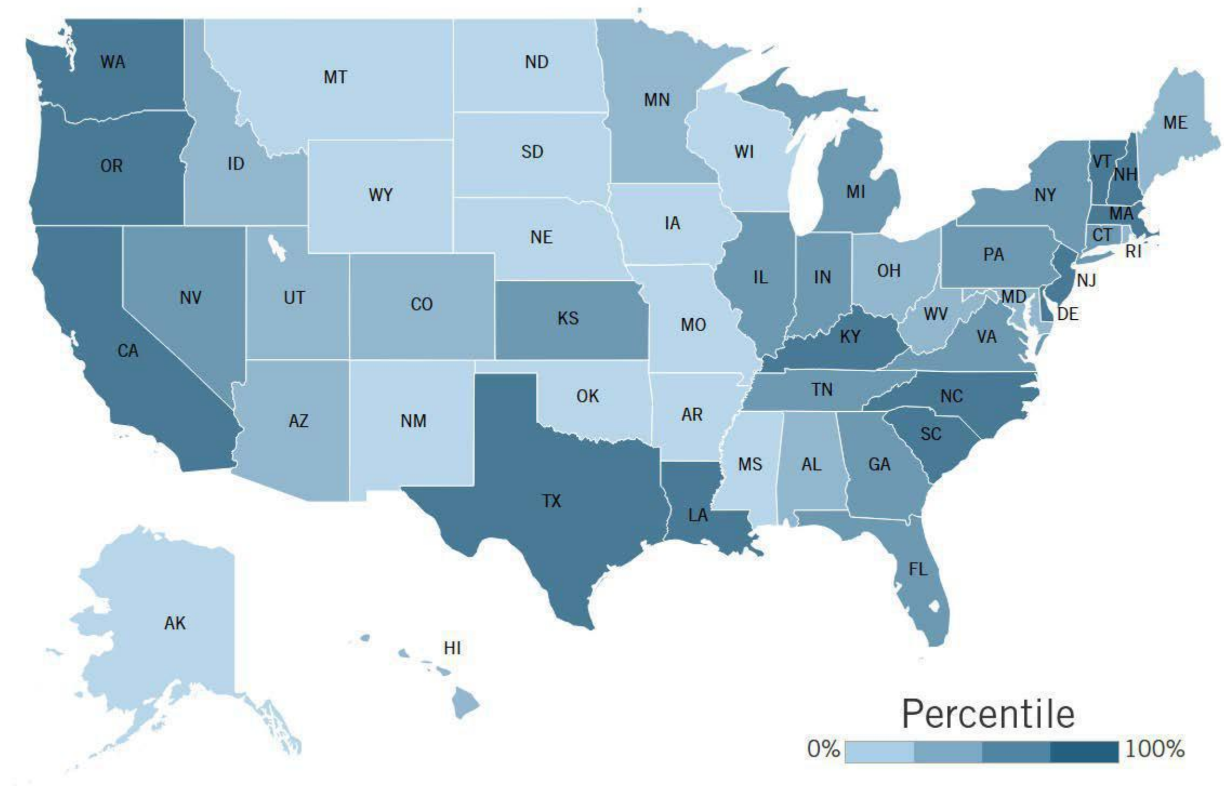
Source: Bureau of Labor Statistics, 2015

GLOBALIZATION

Despite a slowdown in the growth of trade over the last several years, globalization remains a key structural factor of the modern economy. This is evident from the ever-increasing role foreign companies play in supporting and investing in the U.S. economy. In 1988, multinational companies hired 3.8 million workers in the United States. By 2014, this number was 6.4 million.[20] Likewise, the capital expenditures from majority-owned foreign affiliates in the United States increased from 1.1 percent of GDP in 1997 to 1.3 percent in 2014.[21]

When the "old" economy emerged after World War II, the winners were states whose businesses sold to national markets, as opposed to local or regional ones. In today's economy, the winners are the states whose businesses are best integrated into the world economy, as a global orientation ensures expanding markets for a state's industries. Since workers at globally oriented firms also earn higher wages than those at domestically oriented firms, global integration provides a state's workforce with a higher standard of living.[22]

The indicators in this section measure three aspects of globalization: 1) the share of the workforce employed by foreign-owned companies, 2) the extent to which the state's manufacturing and service workforce is employed producing goods and services for export; and 3) the share of a state's gross state product made up of high-tech goods and services exports.

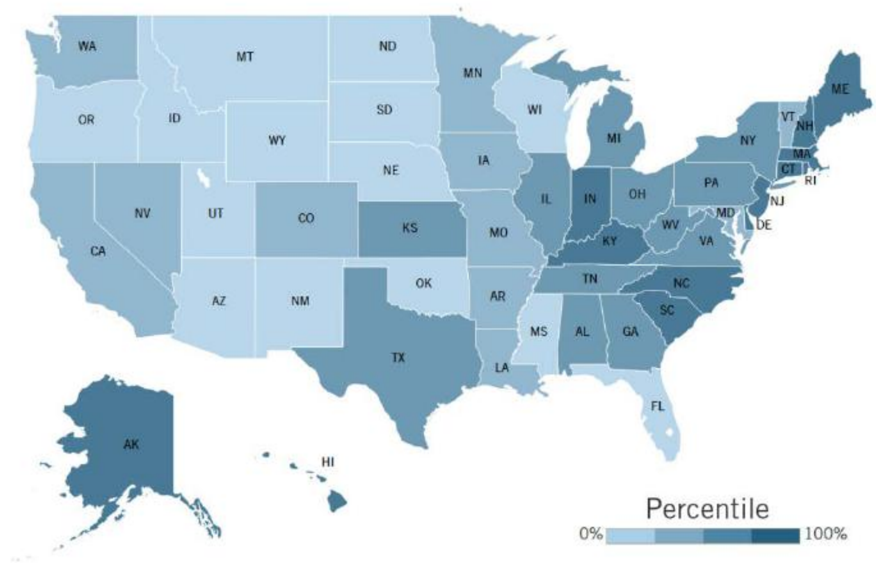


2017 Rank	State	2017 Score	2014 Rank*	2017 Rank	State	2017 Score	2014 Rank*
1	Texas	13.4	3	26	Ohio	9.6	28
2	Washington	13.1	8	26	Rhode Island	9.6	17
3	Massachusetts	12.8	7	26	Arizona	9.6	32
4	Delaware	12.7	1	26	West Virginia	9.6	33
5	Vermont	12.5	16	30	Alabama	9.5	27
6	New Jersey	12.3	5	30	Hawaii	9.5	39
7	South Carolina	12.0	4	32	Minnesota	9.3	34
8	California	11.5	23	32	Utah	9.3	26
9	New Hampshire	11.4	14	34	Idaho	9.2	41
10	Kentucky	11.3	13	35	Maine	9.1	24
10	Louisiana	11.3	15	35	Colorado	9.1	37
11	Oregon	11.1	36	37	Maryland	9.0	25
13	North Carolina	11.0	21	38	Missouri	8.9	43
14	New York	10.9	6	38	Iowa	8.8	38
14	Indiana	10.9	20	40	New Mexico	8.7	47
15	Illinois	10.7	12	41	Mississippi	8.6	46
17	Tennessee	10.6	19	41	Wisconsin	8.6	40
17	Georgia	10.6	11	41	Nebraska	8.6	42
19	Michigan	10.3	18	44	Wyoming	8.5	44
20	Connecticut	10.2	9	45	Arkansas	8.4	45
21	Pennsylvania	10.1	22	46	Alaska	8.3	35
22	Nevada	9.9	2	47	Oklahoma	8.0	48
22	Virginia	9.9	29	48	North Dakota	7.7	30
23	Florida	9.7	10	49	South Dakota	7.5	49
23	Kansas	9.7	31	50	Montana	6.8	50
					U.S. Average	10.0	

**Due to methodological changes, ranking comparisons are not exact*

FOREIGN DIRECT INVESTMENT

Employment in majority-owned foreign companies as a share of private-sector employment



"In 2014, majority-owned foreign companies employed 5.5 percent of the private-sector workforce, and accounted for 5 percent of U.S. GDP."

Why is this important? Incoming foreign direct investment (FDI) refers to investments that foreign companies make to acquire existing facilities or build new facilities in the United States. FDI grew rapidly in the late 1990s, reaching $314 billion in 2000 before dropping to $53 billion in 2003. Since then, FDI has rebounded to $421 billion in 2015.[23] In 2014, majority-owned foreign companies employed 5.5 percent of the private-sector workforce, and accounted for 5 percent of U.S. GDP, up 0.6 and 0.9 percentage points respectively relative to 2009.[24]

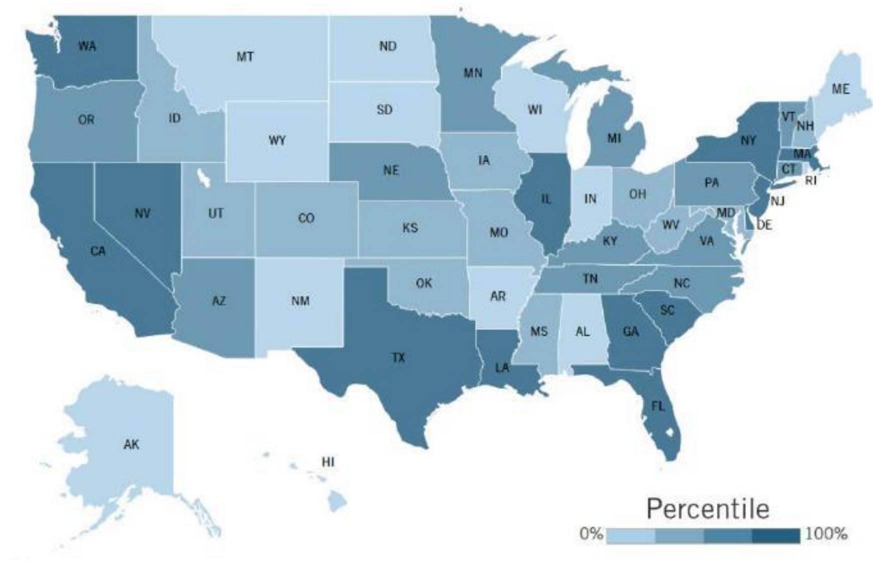
The rankings: States in the North Atlantic region have the highest percentage of their workforce employed by foreign firms due to European private investment. Firms owned by five European countries—France, Germany, the Netherlands, Switzerland, and the United Kingdom—accounted for 50 percent of U.S. employment in foreign firms in 2014.[25] And European firms are more concentrated among northern Atlantic seaboard states, where the share of employment in firms from these five countries is 60 percent.[26] South Carolina is the only state in the top five not in this region. Driven by significant growth in foreign automotive firms in the Greenville-Spartanburg area, South Carolina has largely reinvented itself as an international manufacturing hub.

	The Top Five	Percentage of Workforce Employed by Foreign Companies
1	South Carolina	8.5%
2	New Hampshire	7.8%
2	Delaware	7.8%
4	New Jersey	7.5%
5	Massachusetts	7.4%
	U.S. Average	5.5%

Source: Bureau of Economic Analysis, 2014

EXPORT FOCUS OF MANUFACTURING AND SERVICES

Value of manufacturing and services exports per manufacturing and service worker, adjusted for industry mix



"In the manufacturing sector, exporting firms pay their workers 25 percent more than firms that do not export."

Why is this important? A state's economic vitality depends on the ability of its firms to export goods and services outside the state, and often this means exporting outside the nation. Global exports are important, in part because manufacturers that export can pay their workers 25 percent more than firms that do not export.[27] At the same time, increased digitalization of the economy is enabling many services to be performed practically anywhere in the world. And like in manufacturing, global services exports lead to higher wages. In business services, for example, workers at exporting firms earn almost 20 percent more than their counterparts at comparable non-exporting business services firms.[28]

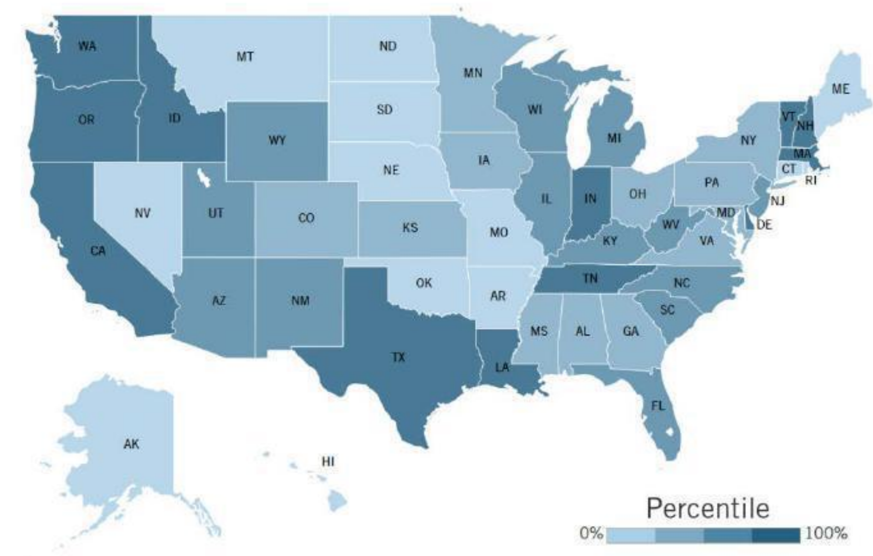
The rankings: The leading states are generally those that have high-value-added, technologically advanced manufacturing and services sectors.[29] Washington ranks first in large part because of Boeing aerospace exports and Microsoft software exports. Texas ranks second due in part to petroleum and computer electronic production. New York and Massachusetts, ranking third and fourth, specialize in advanced manufacturing and financial services exports. California, ranking fifth, has a diverse range of exports, including semiconductors and electronics, biotech, IT services, and professional services.

	The Top Five	Adjusted Export Sales per Manufacturing and Service Worker
1	Washington	$156,266
2	Texas	$111,491
3	New York	$91,463
4	Massachusetts	$91,297
5	California	$88,653
	U.S. Average	$68,446

Source: International Trade Administration, 2015; Census Bureau, 2012

HIGH-TECH EXPORTS

The value of high-tech goods and services exports as a share of gross state product



> *"Much of the 9 percent reduction in the trade deficit from 2011 to 2016 can be attributed to the 20 percent growth in services exports over the same period, and specifically, strong growth in ICT-enabled services exports."*

Why is this important? Trade is increasingly integral to the U.S. economy, having grown from just 11 percent of GDP in 1970 to 26 percent in 2016, and high-tech goods and services represent an especially important slice of that activity. Much of the 9 percent reduction in the trade deficit from 2011 to 2016 can be attributed to the 20 percent growth in services exports over the same period, and specifically, strong growth in ICT-enabled services exports.[30] High-tech goods exports increased by 5 percent over the same period.[31]

The rankings: On average, 3.2 percent of a state's gross product comes from high-tech exports. For smaller states, the main bulk of their high-tech exports tends to stem from one industry, while for larger states, a more diversified industry composition means various high-tech industries contribute more equally to exports. Leading state Vermont performs three times the national average due to strong exports in electronics and computers. Similar to Vermont, Oregon comes in second due to exports from its electronic and computer manufacturing industry. Texas is the only large state that makes the top five, due to sizable exports in both high-tech goods and ICT services.

	The Top Five	High-tech Exports as a Percentage of GSP
1	Vermont	9.4%
2	Oregon	7.6%
3	Texas	6.5%
4	Delaware	5.0%
5	Idaho	4.8%
	U.S. Average	3.2%

*This is a new indicator for this year's *Index.*

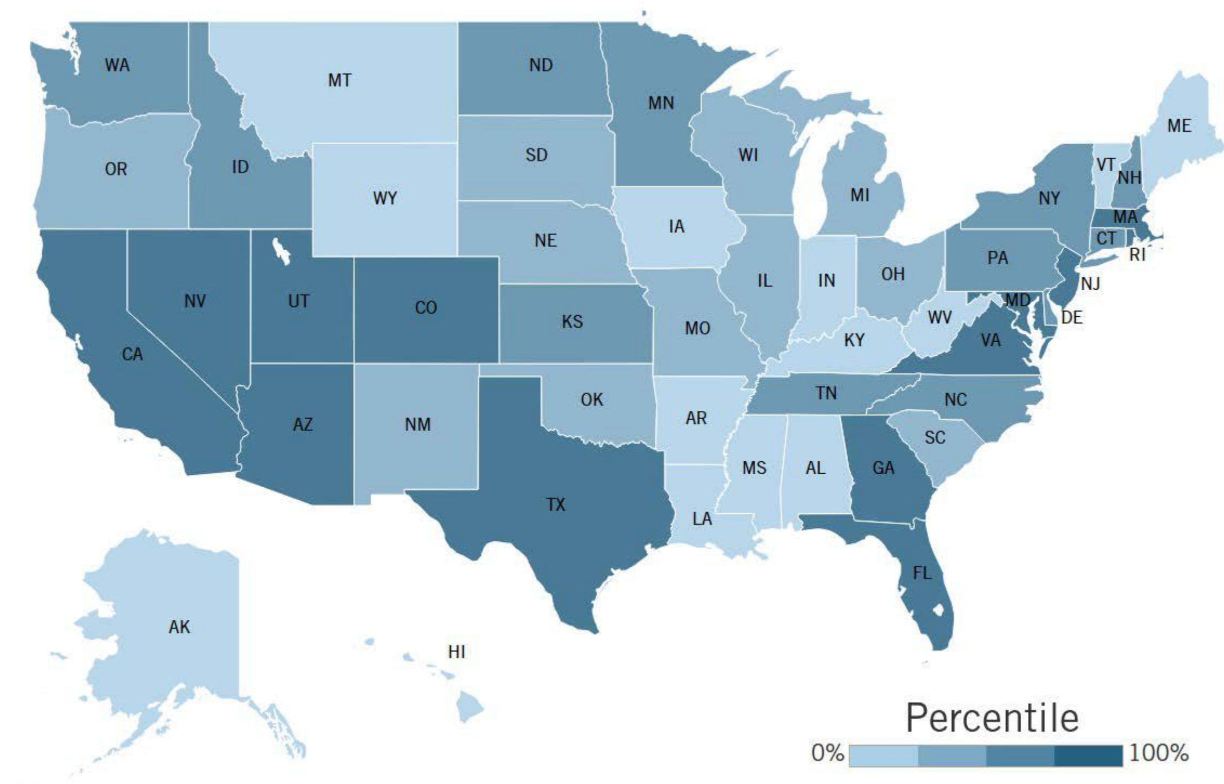
Source: ITIF High-Tech Nation

ECONOMIC DYNAMISM

Economic growth is enabled in no small part by economic dynamism, including the creation of new high-growth companies. So, states' ability to nurture innovative new companies is critical to economic development and vitality. But there is considerable confusion about the role of start-ups and young firms. Many small business advocates and policymakers conflate mom-and-pop start-ups with high-growth start-ups. As economist Antoinette Schoar writes, "It is crucially important to differentiate between two very distinct sets of entrepreneurs: subsistence and transformational entrepreneurs. Recent evidence suggests that people engaging in these two types of entrepreneurship are not only very distinct in nature but that only a negligible fraction of them transition from subsistence to transformational entrepreneurship. These individuals vary in their economic objectives, their skills, and their role in the economy."[32]

And while the start-up rates for mom-and-pop firms have declined, the rates for high-growth tech companies remains strong.[33] MIT's Scott Stern finds that even after controlling for the size of the U.S. economy, the second-highest pace of high-growth entrepreneurship occurred in 2014, an encouraging sign.[34]

With this as context, the indicators in this section measure four key aspects of economic dynamism: 1) the degree of business "churn" in the economy; 2) the number of fast-growing firms; 3) the number and value of companies' initial public offerings (IPOs); and 4) the number of individual inventor patents granted.

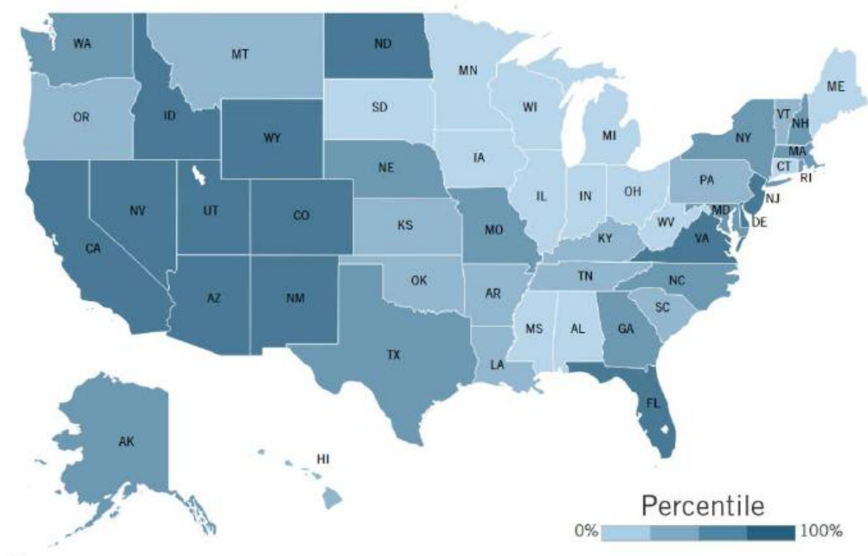


2017 Rank	State	2017 Score	2014 Rank*	2017 Rank	State	2017 Score	2014 Rank*
1	Utah	15.9	1	26	Illinois	9.5	33
2	California	13.9	3	26	Oregon	9.5	26
2	Massachusetts	13.9	4	28	Ohio	9.4	47
4	Virginia	13.7	16	28	Nebraska	9.4	46
5	Colorado	13.6	2	28	Missouri	9.4	40
6	Nevada	12.7	11	31	Michigan	9.0	41
7	Arizona	12.5	5	32	Oklahoma	8.9	36
8	Rhode Island	12.4	28	32	South Carolina	8.9	32
9	Florida	11.9	6	34	New Mexico	8.8	24
10	Georgia	11.7	13	35	South Dakota	8.5	23
10	Texas	11.7	10	35	Wisconsin	8.5	45
12	Maryland	11.6	8	37	Vermont	8.3	15
12	New Jersey	11.6	19	37	Hawaii	8.3	42
14	Idaho	11.5	7	37	Alabama	8.3	49
15	Connecticut	11.0	22	37	Wyoming	8.3	39
15	New York	11.0	14	41	Indiana	8.2	34
17	Washington	10.9	25	42	Louisiana	8.1	35
18	New Hampshire	10.6	17	42	Montana	8.1	12
19	North Carolina	10.3	21	42	Kentucky	8.1	37
20	Tennessee	10.0	43	45	Alaska	7.8	9
21	Pennsylvania	9.9	29	46	Iowa	7.5	48
22	Minnesota	9.7	30	47	Maine	7.1	20
22	Delaware	9.7	18	48	Arkansas	7.0	38
22	Kansas	9.7	31	48	West Virginia	7.0	50
25	North Dakota	9.6	27	50	Mississippi	6.7	44
					U.S. Average	10.0	

**Due to methodological changes, ranking comparisons are not exact*

BUSINESS CHURNING

The number of business establishment start-ups and business failures as a share of total private establishments, averaged over two years



"While turbulence increases the economic risk faced by workers, companies, and even regions, it is an important driver of innovation and productivity growth."

Why is this important? Steady growth in employment masks the constant churning of job creation and destruction, as less innovative and efficient companies downsize or go out of business and more innovative and efficient companies grow or take their place. Along with jobs, new businesses bring with them to the marketplace fresh new ideas and innovations, and they displace older, less innovative businesses (in the process putting to more productive use the resources that previously were tied up in failed businesses). While this turbulence increases the economic risks faced by workers, companies, and even regions, it is an important driver of innovation and productivity growth.

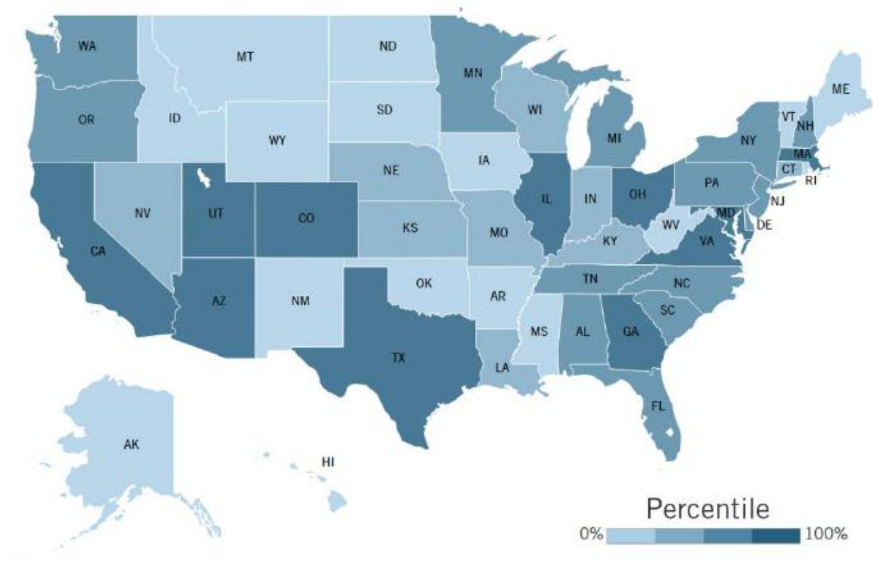
The rankings: California, Florida, Nevada, Utah, and Idaho occupy the top five positions, but only 0.3 percentage points separate first-place from fifth. In contrast, South Dakota, Illinois, Ohio, Iowa, and Connecticut occupy the bottom five positions, and 0.7 percentage points separate 46th place from 50th. Nationwide, 19 percent of businesses are in the process of starting up or failing, on average. This means that for the average state, approximately 10 percent of all firms go out of business every year and another 10 percent of all firms are new.

	The Top Five	Business Establishment Start-ups and Failures as a Percentage of Total Establishments
1	California	22.3%
1	Florida	22.3%
1	Nevada	22.3%
4	Utah	22.0%
4	Idaho	22.0%
	U.S. Average	19.0%

Source: Bureau of Labor Statistics, 2014-2015

FAST-GROWING FIRMS

The average number of firms on the "Inc. 5000" list over the past two years as a share of total firms



"Firms on the "Inc. 5000" list grow their annual revenues by a minimum 40 percent (three year average), with the fastest firm in 2015 growing by 101,000 percent and the fastest firm in 2016 growing by 66,800 percent."

Why is this important? The "Inc. 5000" list is composed of the fastest-growing U.S. firms. Firms on this list grow their annual revenues by a minimum three-year average of 40 percent, with the top firm in 2015 growing 101,000 percent and the fastest firm in 2016 growing 66,800 percent. The average firm on the list grew by 487 percent in 2016, and a third of firms on the list grew by less than 100 percent. While the number of firms in an economy attaining such growth rates is generally quite small, they hold strong promise for continued growth and thus have an outsized impact on the economy. In fact, there are a number of well-known companies (including Microsoft and the hair-care brand Paul Mitchell) that were listed on the "Inc. 5000" before they became household names.

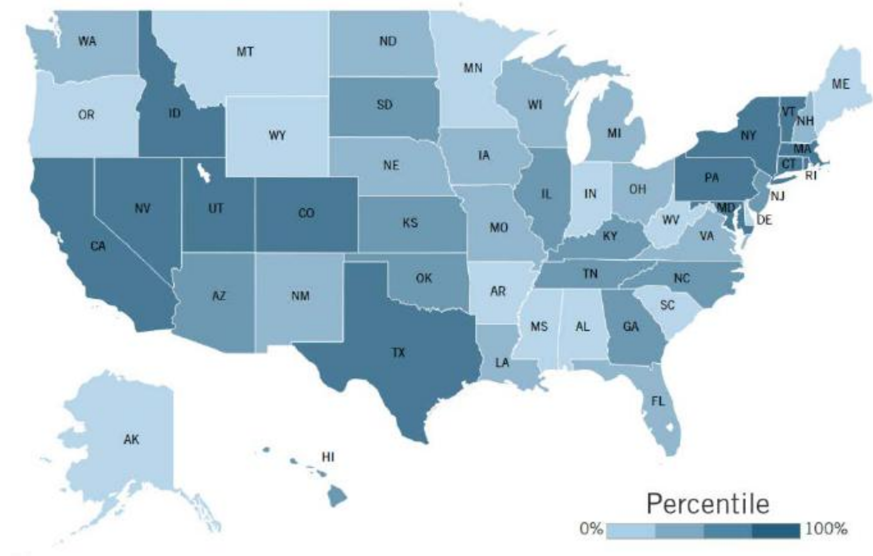
The rankings: Not surprisingly, states that perform well on the "Inc. 5000" list are generally known for having strong entrepreneurial technology sectors. Indeed, the majority of "Inc. 5000" firms in the top states, especially Virginia, Maryland, and California, are IT or telecommunications firms, while Massachusetts has a large number of medical technology firms. Many states that perform well have developed clusters of well-organized fast-growing firms and have support systems to help firms grow. For example, local university partnerships have helped Provo, Utah, clinch first among metropolitan areas arranged by "Inc. 5000" firms per capita.[35] Arizona and Georgia also have developed innovation ecosystems conducive to firm innovation and growth.

	The Top Six	Percentage of Firms That Are Fast-growing
1	Virginia	0.20%
2	Utah	0.16%
3	Georgia	0.13%
4	Massachusetts	0.11%
5	Arizona	0.10%
5	Maryland	0.10%
	U.S. Average	0.08%

Source: *Inc. 5000, 2015-2016*

INITIAL PUBLIC OFFERINGS

A composite score of the value of and number of initial public stock offerings as a percentage of worker's income



"Although IPO valuation peaked in 2014, the median deal size of IPOs has steadily decreased since the recession—in 2009, the median deal was $155 million, falling to $95 million in 2016."

Why is this important? Initial public offerings (IPOs)—the first rounds of stock that companies sell when they make their debuts in public markets—are an important way high-growth firms raise capital to enable their next rounds of growth. Total proceeds from U.S. IPOs were valued at $85.3 billion in 2014, making it the strongest year for IPOs since the tech bubble in 2001. But in 2016, IPO valuations fell to $19 billion, a figure lower than the Great Recession low of $22 billion. Although IPO valuation peaked in 2014, the median deal size of IPOs has steadily decreased since the recession—in 2009, the median deal was $155 million, falling to $95 million in 2016. While the total value of IPOs, the number of deals, and median deal size have varied in recent years, certain trends hold steady. For example, healthcare and ICT sectors dominate the IPO market, with these sectors raising 60 percent of IPO proceeds in 2014, 2015, and 2016.[36]

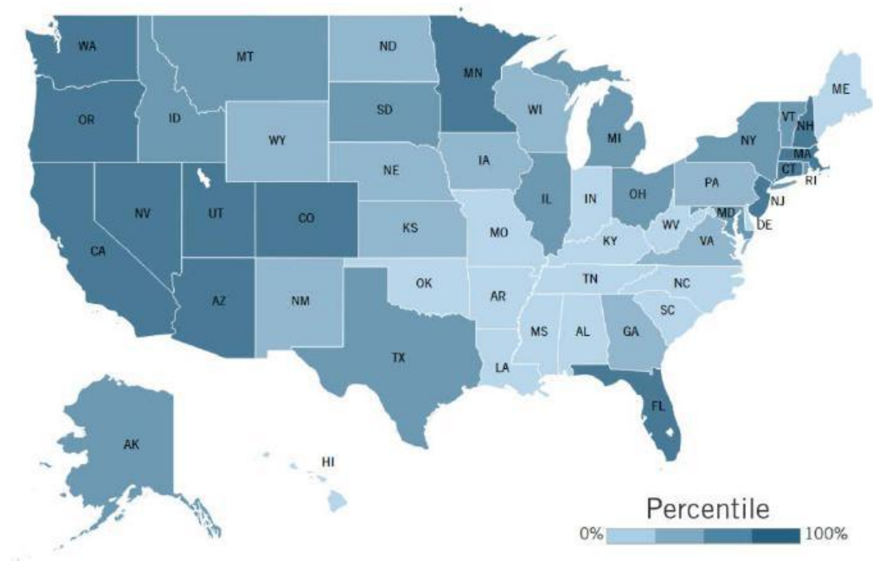
The rankings: Rhode Island ranks number one due to a single IPO—Citizens Financial Group—which was valued at $4 billion, the largest U.S. IPO between 2014 and 2016. Connecticut and Massachusetts rank second and third, respectively, in part due to pharmaceutical deals. Nevada ranks fourth through a mix of technology and real estate deals, with Colorado coming in fifth from its many energy-technology deals. At the bottom of the rankings, seven states had no IPOs over this period.

	The Top Five	Composite Score
1	Rhode Island	8.76
2	Connecticut	6.91
3	Massachusetts	6.78
4	Nevada	6.30
5	Colorado	6.19
	U.S. Average	5.00

Source: IPO Monitor, 2014-2016

INVENTOR PATENTS

The number of independent inventor patents as a share of the adult population



"Thirty-nine percent of independent inventor patent filers reported sales from their inventions, and 20 percent turned profits."

Why is this important? From Benjamin Franklin to Thomas Edison to Steve Jobs, the independent inventor is an established American icon. Today, many owners of individual patents—those patents not assigned to any organization—are not mere tinkerers, but trained scientists, engineers, or students pursuing independent research. This innovation can be an important foundation for entrepreneurial ventures, and some so-called "inventor patents" can spark significant economic activity. Indeed, 39 percent of independent inventor patent filers reported sales from their inventions, and 20 percent turned profits.[37]

The rankings: Not surprisingly, states with a large number of inventor patents are also likely to have a large number of scientists and engineers.[38] Many of these states also have colleges and universities with strong science and engineering programs. States that are typically strong in tech-based entrepreneurial activity, including Utah, California, and Massachusetts, perform well. The states generating the fewest inventor patents per capita tend to be southeastern states, with workforces rooted in agriculture, more traditional industries, and historically lower levels of entrepreneurial activity.

	The Top Five	Patents per 1,000 People of Workforce Age
1	Utah	0.169
2	California	0.142
3	New Hampshire	0.114
4	Massachusetts	0.111
5	Colorado	0.104
	U.S. Average	0.079

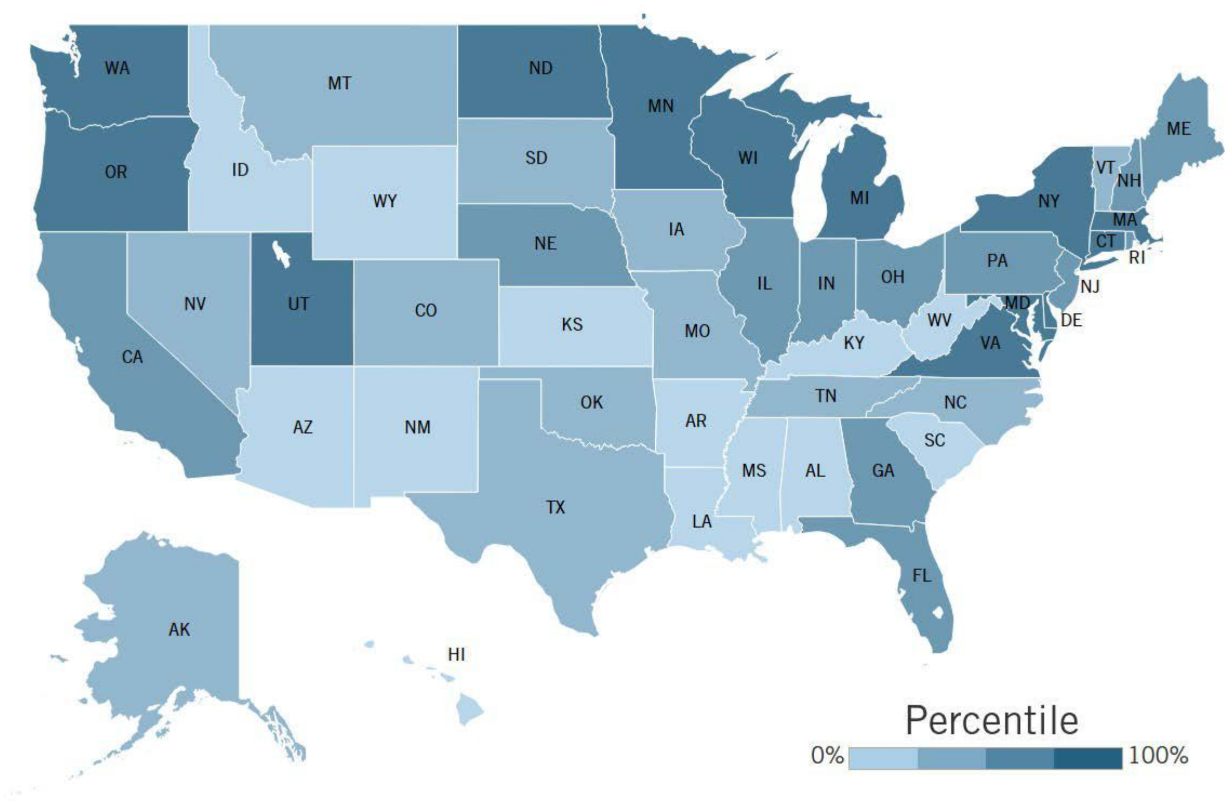
Source: Patent and Trademark Office, 2014-2015

THE DIGITAL ECONOMY

In the digital economy, a significant share of transactions are conducted through digital means. For example, in 2016, 8.3 percent of retail sales were conducted online, as compared to only 4.3 percent in 2010. Moreover, between 2010 and 2016, U.S. retail sales through e-commerce increased by 15.1 percent annually compared to just 3.3 percent annually for total retail sales. Total U.S. e-commerce sales reached $395 billion in 2016—a value equivalent to 30 percent of U.S. goods exports.[39]

The increase in e-commerce activity has followed widespread adoption of IT tools and infrastructure. In 2015, 87 percent of U.S. households owned a computer while 89 percent were connected to the Internet.[40] Farmers now routinely use the Internet for everything from navigating their field equipment to buying seed and fertilizer, tracking market prices, and selling crops. Meanwhile, governments provide open data access so that data scientists and engineers can develop advanced analytics to solve problems and provide solutions to societal challenges.[41]

The indicators in this section measure four aspects of the digital economy: 1) the percentage of farmers online and using computers for business; 2) the use of IT to deliver state government services; 3) the adoption and average speed of broadband telecommunications; and 4) use of health information technologies.

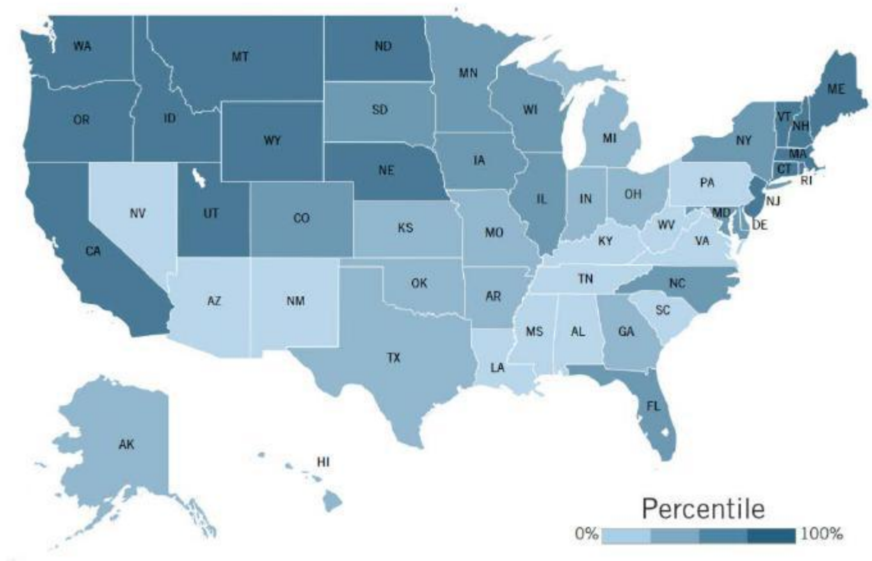


2017 Rank	State	2017 Score	2014 Rank*	2017 Rank	State	2017 Score	2014 Rank*
1	Virginia	12.7	12	26	Vermont	10.1	7
1	Washington	12.7	15	26	North Carolina	10.1	30
3	Utah	12.6	13	26	Tennessee	10.1	35
3	Massachusetts	12.6	1	26	South Dakota	10.1	16
5	Maryland	12.2	25	30	Colorado	10.0	6
6	Michigan	12.0	5	31	Iowa	9.6	20
7	New York	11.8	18	31	Montana	9.6	36
7	Oregon	11.8	10	33	Missouri	9.5	29
9	Wisconsin	11.7	8	34	Alaska	8.8	43
9	North Dakota	11.7	11	34	Nevada	8.8	39
11	Minnesota	11.5	2	36	Texas	8.7	38
12	Delaware	11.3	17	37	Oklahoma	8.6	48
13	Connecticut	11.2	9	38	West Virginia	8.5	40
14	Rhode Island	11.0	4	38	Wyoming	8.5	32
14	Pennsylvania	11.0	21	40	Arizona	8.4	37
16	New Jersey	10.9	14	41	Idaho	8.3	34
16	California	10.9	19	41	Kentucky	8.3	44
16	New Hampshire	10.9	3	43	Arkansas	8.0	42
19	Maine	10.8	24	44	South Carolina	7.9	46
20	Illinois	10.7	23	44	Hawaii	7.9	41
21	Nebraska	10.6	27	46	Kansas	7.3	28
21	Florida	10.6	33	46	New Mexico	7.3	50
23	Indiana	10.5	26	48	Alabama	7.2	49
23	Ohio	10.5	22	48	Mississippi	7.2	47
25	Georgia	10.2	31	50	Louisiana	6.6	45
					U.S. Average	10.0	

*Due to methodological changes, ranking comparisons are not exact

ONLINE AGRICULTURE

A composite score of the percentage of farms that use computers for business and with Internet access



"In 2015, 70 percent of farms had access to the Internet, compared to 59 percent in 2009 and 29 percent in 1999."

Why is this important? While agriculture accounts for just 1.6 percent of U.S. employment, in many states it remains an important component of the economy.[42] Farmers and ranchers use the Internet to navigate field equipment, buy feed and seed, check on weather conditions, obtain the latest technical information, and even to sell their livestock or crops. In 2015, 70 percent of farms had access to the Internet, compared to 59 percent in 2009 and 29 percent in 1999. More importantly, farmers have leveraged technology to improve their operations, with 43 percent of farmers using computers to conduct business (i.e., purchase agricultural inputs, conduct marketing activities), up 7 percentage points since 2009.[43] Two measures used for this indicator are the percentage of farmers with Internet access, and the percentage that use computers to help run their farms.

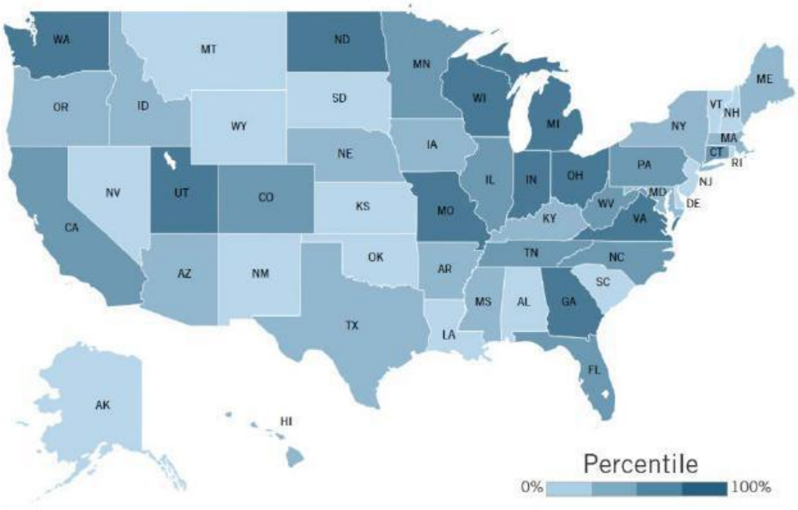
The rankings: Farmers in New England states lead the nation in both use of computers and access to the Internet, as well as in the percentage of farmers who conduct business on the USDA website. Mountain states did well, while states in the South and Southwest ranked near the bottom.

	The Top Ten	Composite Score
1	New England States	6.65
7	New Jersey	6.20
8	Oregon	6.07
9	Wyoming	5.99
10	Montana	5.84
	U.S. Average	5.00

Source: Department of Agriculture, 2015; New England States comprise of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

E-GOVERNMENT

An index that scores a state government's use of digital technologies



"Government can become a highly efficient enterprise that uses technology not only to cut its own costs, but also to boost productivity for businesses and residents."

Why is this important? State governments affect economies in two ways. First, as large employers, their operations represent a significant amount of economic activity. Second, as they interact with the rest of the economy, particularly businesses, their degree of efficiency and effectiveness in providing public services can enable or retard innovation. In the absence of good measures of state government innovation, one indicator is their use of digital technologies.

Certainly, with a wide suite of technologies readily available—from cloud and mobile computing to the Internet of Things and machine learning—there is significant potential to transform state government with IT.[44] Government programs can be leaner, employing fewer workers and using fewer materials. Self-service can be ubiquitous. Every public service, from garbage collection to traffic management, could use analytics and the Internet of Things to optimize operations. In short, government can become a highly efficient enterprise that uses technology not only to cut its own costs, but also to boost productivity for businesses and residents.

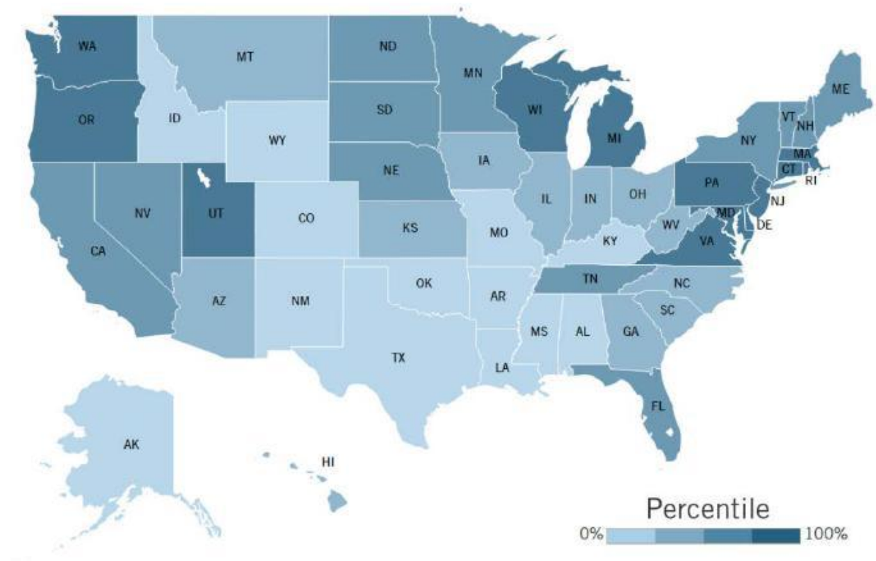
The rankings: E-government leadership is largely driven by individual factors, such as a governor's leadership, the performance of a state Chief Information Officer, and support from legislators. As such, there is no real pattern to state leadership on this indicator. Top states have done a variety of innovative things. For example, Virginia's Hospital Alerting and Status System streamlined submission of emergency reports, eliminating a previous multi-step process; Missouri rolled out cloud services for its state agencies and implemented analytics software to tackle tax fraud; and Ohio deployed traffic and weather sensors to provide real-time data on road conditions for maintenance workers.[45] Washington is the most improved state, moving up 41 positions in the rankings since the 2014 *Index*. It now offers a live chat feature for businesses struggling with the intricacies of tax filings, and it implemented a one-stop web resource for those looking to start a business, among other initiatives.

	The Top Five	Composite Score
1	Missouri	100
1	Virginia	100
1	Utah	100
1	Ohio	100
1	Michigan	100
	U.S. Average	90

Source: Center for Digital Government, 2016

BROADBAND TELECOMMUNICATIONS

A composite score of home broadband adoption and average internet connection speeds



"From 2012 to 2016, average connection speeds across the country have increased by 162 percent."

Why is this important? Broadband adoption is important not just because it allows residents to more easily engage in e-commerce, but also because it enables telecommuting, distance education, telemedicine, and a host of other applications that can boost productivity and improve quality of life.[46] Broadband adoption rose from 10 percent of all U.S. Internet connections in 2000 to 86 percent in 2016.[47] And, from 2012 to 2016, average connection speeds increased 162 percent.[48]

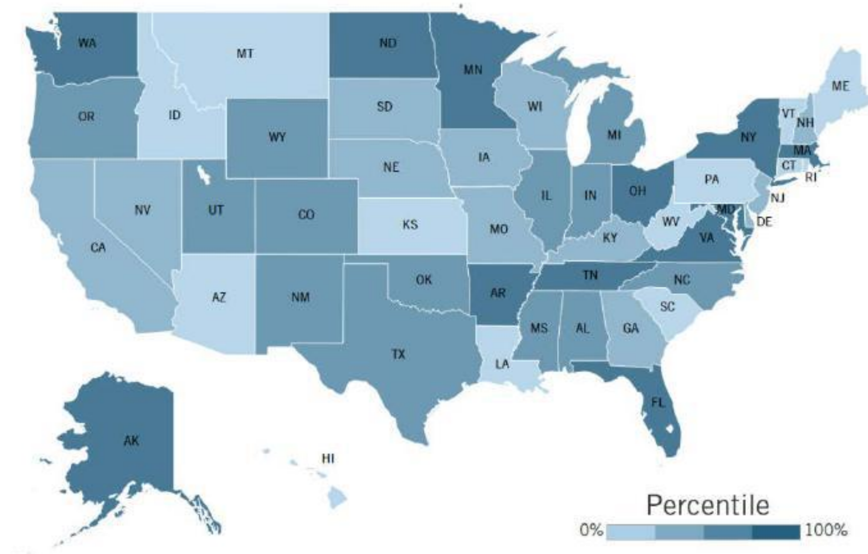
The rankings: Broadband adoption and speeds tend to be highest in high-tech, high-income states. Many of the top-scoring states are served by Verizon, which widely deployed fiber-to-the-home technology, prompting a competitive response from cable providers. Because it is less costly to invest in broadband in metropolitan areas, states that are predominately urban are much more likely to have extensive broadband networks. And because low-income households are less likely subscribe to broadband, it becomes more costly to serve these areas and low-income states tend to lag. Indeed, the broadband telecommunication score has a correlation of 0.50 to population density and gross state product per capita.[49] Following the population distribution across the United States, seven out of the top ten states are located along the highly urbanized East Coast. Meanwhile, each state in the bottom five—Mississippi, Arkansas, New Mexico, Alabama, and Louisiana—either has low output per capita or a large rural population.

	The Top Five	Composite Score
1	Delaware	6.45
2	Rhode Island	6.44
3	Pennsylvania	6.42
4	Virginia	6.34
5	Maryland	6.23
	U.S. Average	5.00

Source: Akamai 2015; National Telecommunications and Information Administration 2015

HEALTH IT

A composite score of pharmacies that can prescribe drugs electronically, hospitals that have basic electronic health record systems, and hospitals that have electronic patient engagement



"Since 2010, patients receiving their prescriptions electronically experienced a three-fold increase, with over 1.4 billion e-prescription transactions in 2015 alone."

Why is this important? Health care is a growing share of the U.S. economy, at 16.9 percent of GDP, so spurring innovation in health care produces significant knock-on benefits.[50] One indicator of innovation in health care is IT adoption, which has advanced rapidly in the last few years. Since 2010, the number of patients receiving prescriptions electronically has increased three-fold, with over 1.4 billion e-prescription transactions in 2015 alone.[51] Meanwhile, hospitals have increased their use of electronic health record systems (EHRs). In 2008, just under 10 percent of hospitals had adopted EHRs, but by 2015 it was up to 83 percent.[52] Synchronizing patients' medical histories in this way saved hospitals $400 million in 2015.[53] Hospitals also have rolled out electronic patient engagement platforms, giving patients myriad ways to access their health information, pay bills, request refills, and schedule appointments, with more engagement features being released every year.[54]

The rankings: State rankings appear to be determined partly by the extent to which leaders in the health care industry and state government make health IT a priority. New York's top ranking reflects its serious push to modernize its health systems and adopt e-prescribing (just under 40 percent of its prescriptions were routed electronically in 2015.) Maryland, Virginia, Massachusetts, and Washington rank second through fifth, reflecting a concerted effort on the part of their hospitals to adopt EHR systems and offer patients more opportunities for electronic engagement. Approximately 9 in 10 hospitals in these four states have EHR systems and 8 in 10 hospitals engage their patients electronically.

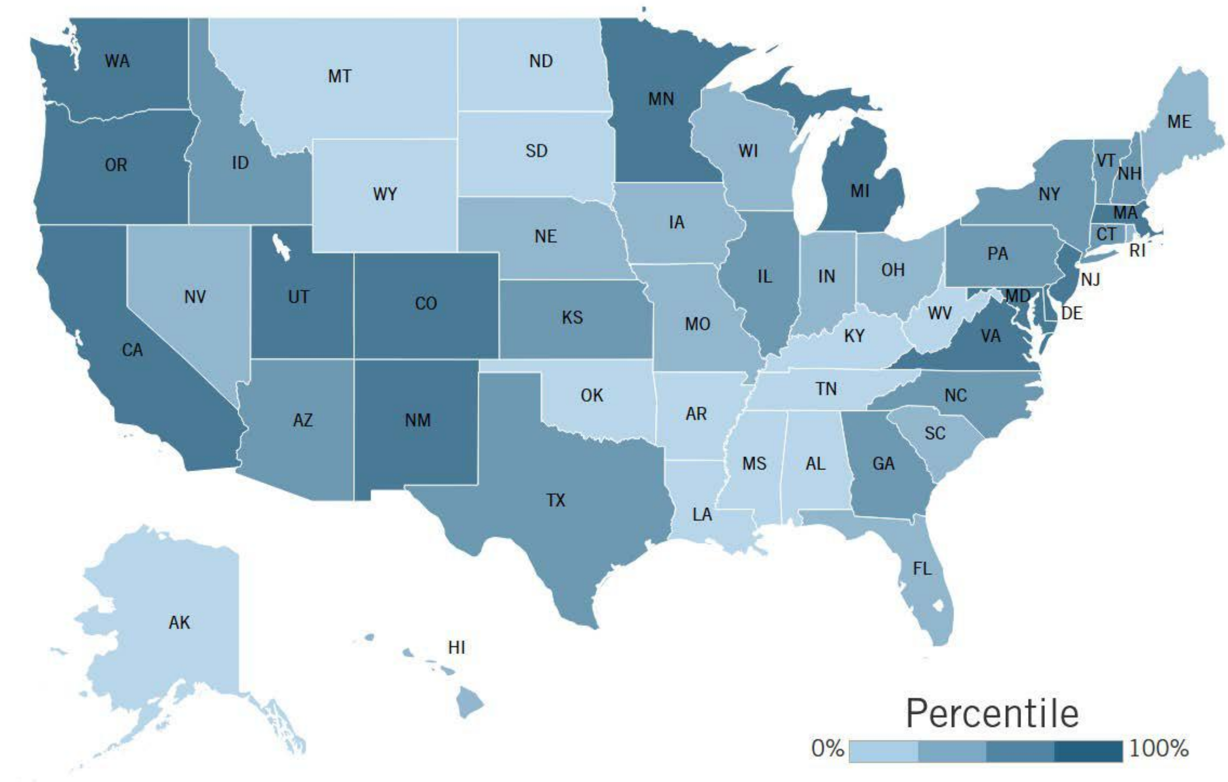
	The Top Five	Composite Score
1	New York	6.51
2	Maryland	6.08
3	Virginia	5.85
4	Massachusetts	5.84
5	Washington	5.72
	U.S. Average	5.00

Source: Surescripts, 2016; Office of the National Coordinator for Health Information, 2015

INNOVATION CAPACITY

Innovation is key to growth and competitiveness. Studies show that it is not the amount of capital, but the effectiveness with which it is used that accounts for as much as 90 percent of the variation in income growth per worker.[55] Technological innovation, in particular, is a fundamental driver of growth because it drives efficiency.

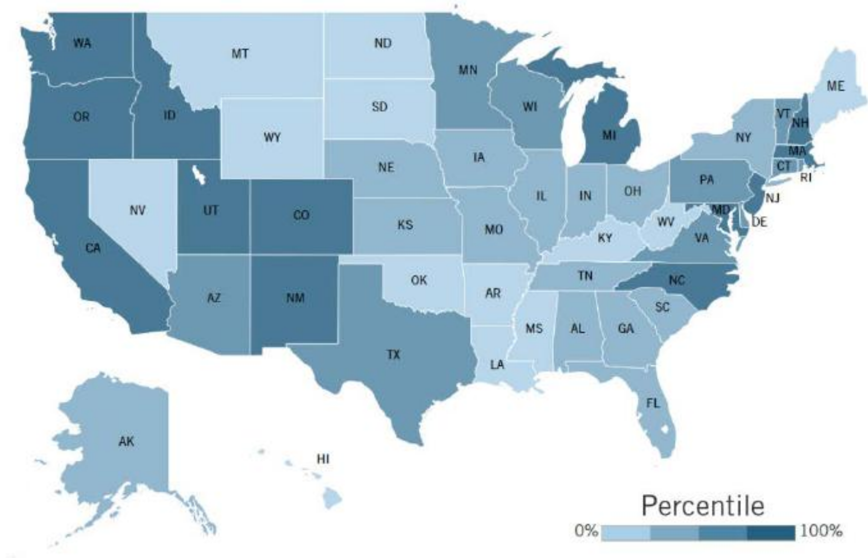
The indicators in this section measure seven aspects of innovation capacity: 1) share of jobs in high-tech industries; 2) the share of workers who are scientists and engineers; 3) the number of patents issued to companies and individuals; 4) industry R&D as a share of GSP; 5) non-industrial R&D as a share of GSP; 6) clean energy consumption; and 7) venture capital invested as a share of GSP.



2017 Rank	State	2017 Score	2014 Rank*	2017 Rank	State	2017 Score	2014 Rank*
1	Massachusetts	19.3	2	26	Ohio	9.3	27
2	California	17.6	3	27	Florida	9.2	31
3	Delaware	15.9	4	27	Wisconsin	9.2	28
4	Washington	15.2	1	29	Rhode Island	8.8	21
5	Michigan	14.6	9	29	Missouri	8.8	29
6	Colorado	14.4	7	31	Hawaii	8.5	42
7	Maryland	14.3	5	32	Nevada	8.3	30
8	New Jersey	13.4	8	33	Indiana	8.0	35
9	New Mexico	13.2	16	33	Maine	8.0	39
10	Minnesota	12.6	13	35	Iowa	7.9	36
11	Virginia	12.3	6	35	Nebraska	7.9	37
12	Utah	12.2	12	37	South	7.8	32
13	Oregon	12.1	14	38	Alaska	7.5	38
14	Connecticut	11.8	11	39	Alabama	7.4	26
15	Arizona	11.6	17	40	Tennessee	7.2	40
16	Idaho	11.5	15	41	Montana	7.1	33
17	Vermont	10.8	23	42	Kentucky	6.9	43
17	New York	10.8	18	43	Wyoming	6.8	41
19	New Hampshire	10.7	10	44	South Dakota	6.7	44
19	Illinois	10.7	19	45	Oklahoma	6.5	46
21	North Carolina	10.3	22	46	Louisiana	5.8	49
22	Georgia	9.6	25	46	North Dakota	5.8	45
22	Kansas	9.6	34	48	West Virginia	5.3	48
24	Pennsylvania	9.5	20	49	Mississippi	5.1	50
24	Texas	9.5	24	50	Arkansas	5.0	47
					U.S. Average	10.0	

HIGH-TECH JOBS

Employment in high-tech industries as a share of private-sector employment



"In 2015, the average high-tech industry wage was more than double the average private-sector wage."

Why is this important? The high-tech sector remains a key engine of innovation, export-based competitiveness, and high-paying jobs. In 2015, the average high-tech industry wage was more than double the average private-sector wage.[56] In 2015, there were 5.7 million jobs in high-tech industries, accounting for 4.8 percent of U.S. employment. Moreover, most high-tech jobs are in export-serving industries that sell a majority of their output outside the state.

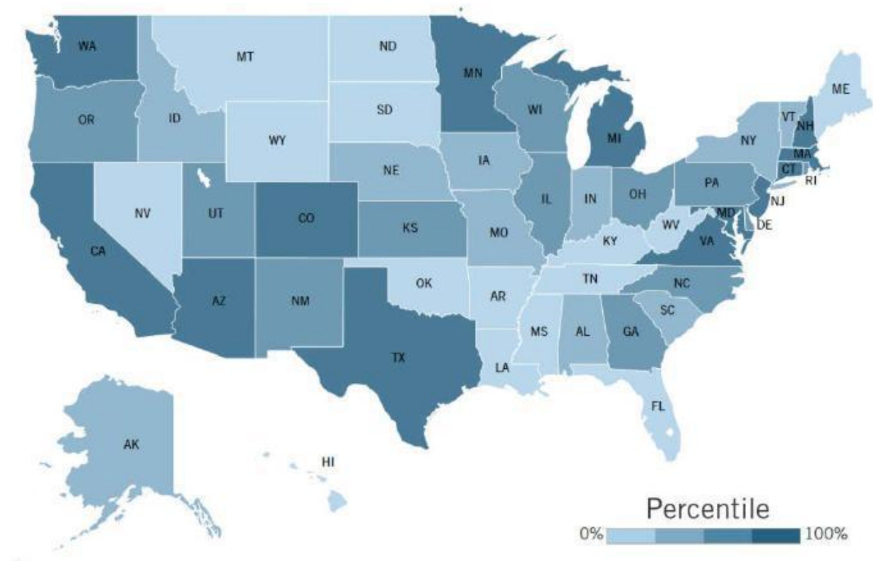
The rankings: High-tech specialization of states varies significantly, from a high of 7.9 percent of the workforce in Massachusetts to just 2.4 percent in Wyoming. While all states have high-tech jobs, the leaders tend to be in the Northeast, the Mountain states, and the Pacific region. High-tech industry jobs are often concentrated in particular regions of a state: information technology in southern New Hampshire; software in Provo, Utah and Seattle, Washington; semiconductors in Boise, Idaho and Albuquerque, New Mexico; biotechnology in the Washington, D.C. area; telecommunications in Denver, Colorado; and a broad mix of technologies in Silicon Valley, Los Angeles, and Boston, Massachusetts. States with lower rankings tend to be natural-resource-dependent states (such as Alaska, Montana, and Wyoming), or southern states with more branch-plant traditional industries (such as Mississippi, Louisiana, and Kentucky).

	The Top Five	Percentage of Jobs in High-tech Industries
1	Massachusetts	7.9%
2	New Mexico	7.3%
3	New Hampshire	7.1%
4	Washington	6.9%
5	California	6.8%
	U.S. Average	4.8%

Source: Bureau of Labor Statistics, 2015

SCIENTISTS AND ENGINEERS

Scientists and engineers as a share of private-sector employment



"States that tend to have a higher share of scientists and engineers in their private sector also have a high share of fast growing firms and are able to attract other high skilled workers from other states."

Why is this important? A high-quality scientific and engineering workforce is critical to economic growth, as these workers drive innovation in both new products and production processes, which leads to higher-wage jobs and greater economic output. Though scientists and engineers comprised just 3.4 percent of all private-sector jobs in 2016, they are central players in high-tech and research-based companies and in advanced manufacturing.[57] Moreover, states with a higher share of scientists and engineers in their private sectors also tend to have a high share of fast-growing firms and are better able to attract other high-skilled workers from other states.[58]

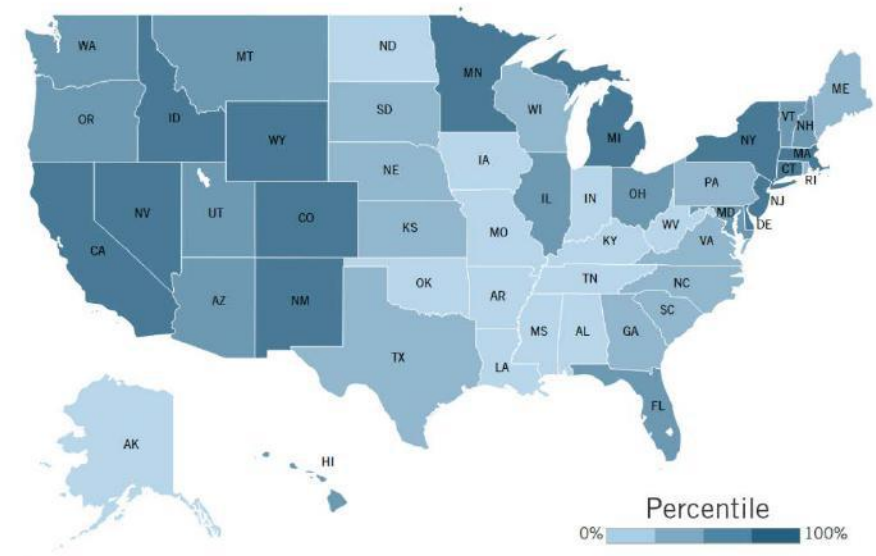
The rankings: States with the highest rankings tend to be high-tech states such as Washington, Virginia, Massachusetts and Colorado; states with significant corporate R&D laboratory facilities (such as Delaware, Connecticut, New Jersey, New York, and Vermont); or states with significant federal laboratory facilities (such as Maryland, New Mexico, and Rhode Island). In addition, many of these states have robust science and engineering programs in colleges and universities. States that lag behind have few high-tech companies or labs, and relatively limited science and engineering higher education programs.

	The Top Five	Scientists and Engineers as a Percentage of Total Jobs
1	Washington	5.4%
2	Virginia	5.2%
3	Massachusetts	5.1%
4	Colorado	4.9%
5	Maryland	4.8%
	U.S. Average	3.4%

Source: Bureau of Labor Statistics, 2016

PATENTS

The number of patents issued to companies per 1,000 private-sector workers, adjusted for industry mix



"Since hitting a recession low in 2008 of 77,500, patent grants have increased by over 86 percent."

Why is this important? Firms' capacity to develop new products and processes is a key determinant of their competitive advantage and ability to pay higher wages. In fact, one study finds that firms not replacing at least 10 percent of their revenue streams annually with new products or services are likely to be out of business within five years.[59] One indicator of the rate of new product innovation is the number of patents issued. As technological innovation has become more important, the number of patents issued per year to U.S.-based inventors has grown from 85,000 in 2000 to 144,000 in 2014. Indeed, since hitting a low of 77,500 in 2008, patent grants have increased by over 86 percent.[60]

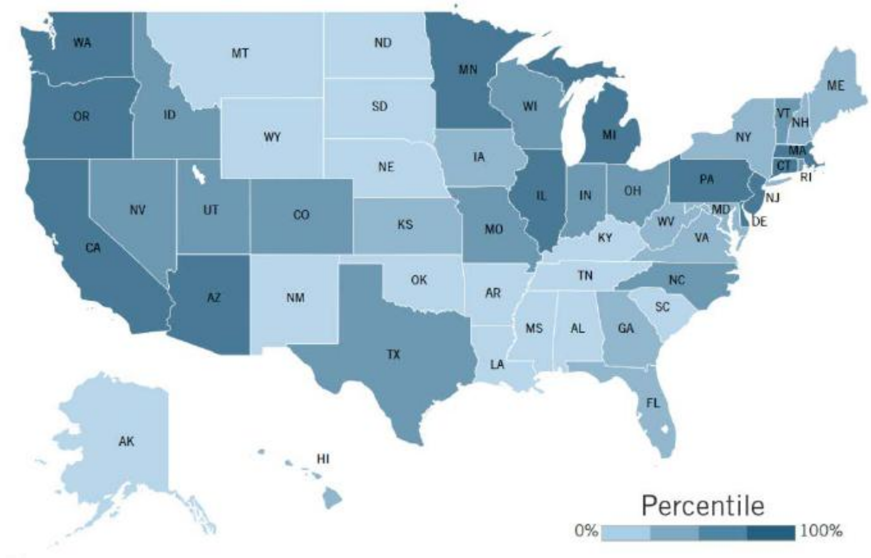
The rankings: States with an above-average share of either high-tech corporate headquarters or R&D labs tend to score the highest. On average, 10 patents are granted per 1,000 private-sectors workers in the United States. One factor that has helped Delaware rise to the top is a strong concentration of high-tech manufacturing industries (as evident from Manufacturing USA's 11th biopharmaceutical institute being sited at the University of Delaware). It is no surprise that states that have strong business investment in R&D also have a high number of patents granted, with these two indicators correlated at 0.67.

	The Top Five	Adjusted Patents per 1,000 Workers
1	Delaware	24.5
2	New Jersey	19.5
3	Minnesota	17.5
4	Michigan	17.1
4	Nevada	17.1
	U.S. Average	10.3

Source: Patent and Trademark Office, 2012

INDUSTRY INVESTMENT IN R&D

The amount of research and development paid for by industry as a share of gross state product, adjusted for industry mix



"Since 2004, industry R&D spending picked up, reaching an all-time high of 1.97 percent of GDP in 2008. However, by 2013, industry R&D had fallen slightly to 1.93 percent of GDP."

Why is this important? Research and development yields product and process innovations, adds to the knowledge base of industry, and is a key driver of economic growth. In 2013, business performed 71 percent of all U.S. R&D—and companies funded 92 percent of that research themselves.[61] After steadily rising in the 1980s and falling in the early 1990s, industry R&D as a share of GDP peaked in 2000 before declining through 2004. Industry R&D spending then picked up again, reaching an all-time high of 1.97 percent of GDP in 2008. However, by 2013, industry R&D had fallen slightly to 1.93 percent of GDP.[62]

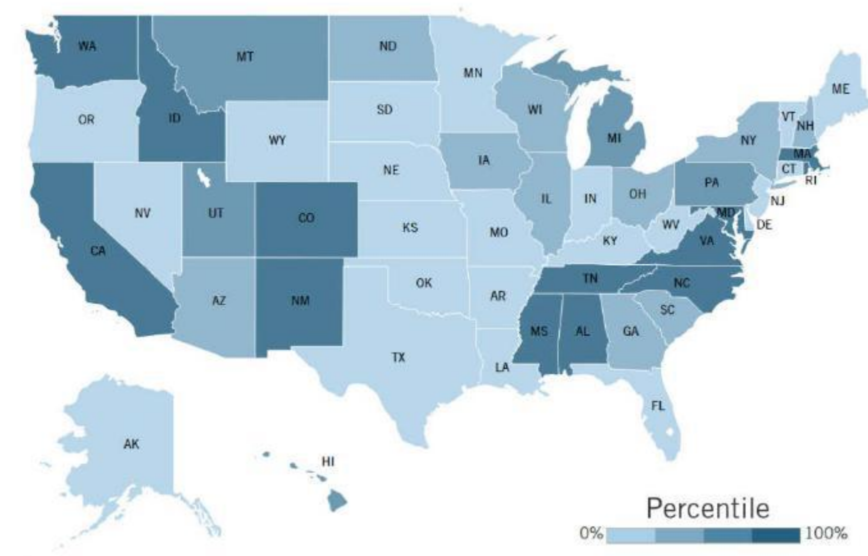
The rankings: Delaware leads in part because R&D-intensive firms like DuPont are such a large part of the state's economy. Much of Michigan's success is due to its auto industry hub, which is home to much of North American automotive R&D. Massachusetts, Connecticut, and Oregon each have established high-technology industries with high R&D expenditures. In general, states with significant corporate R&D laboratory facilities or with a large number of high-tech firms score well.

	The Top Six	Adjusted R&D as a Percentage of GSP
1	Delaware	4.1%
2	Michigan	3.0%
3	California	2.5%
4	Massachusetts	2.1%
5	Connecticut	2.0%
5	Oregon	2.0%
	U.S. Average	1.5%

Source: National Science Foundation, 2013

NON-INDUSTRY INVESTMENT IN R&D

The amount of research and development performed outside of industry as a share of gross state product



"In 2006, 77 of the 88 U.S. entities that produced award-winning innovations were beneficiaries of federal funding."

Why is this important? While R&D performed outside of business constitutes only 29 percent of total U.S. R&D, federal, state, university, and nonprofit R&D has had a substantial impact on innovation.[63] For example, in 2006, 77 of the 88 U.S. entities that produced award-winning innovations were beneficiaries of federal funding.[64] In addition to research in U.S. universities, the federal government invests billions on federal laboratories, which foster partnerships with universities and private industries and help lay the foundation for future private-sector research. In 2011, 350 firms, including 47 *Fortune 500* companies, used federally funded laboratory facilities and specialized equipment to conduct research that facilitated private-sector innovations.[65] Moreover, research by universities and non-profits between 1996 and 2013 was credited with increasing GDP by $518 billion and creating 3.8 million jobs.[66]

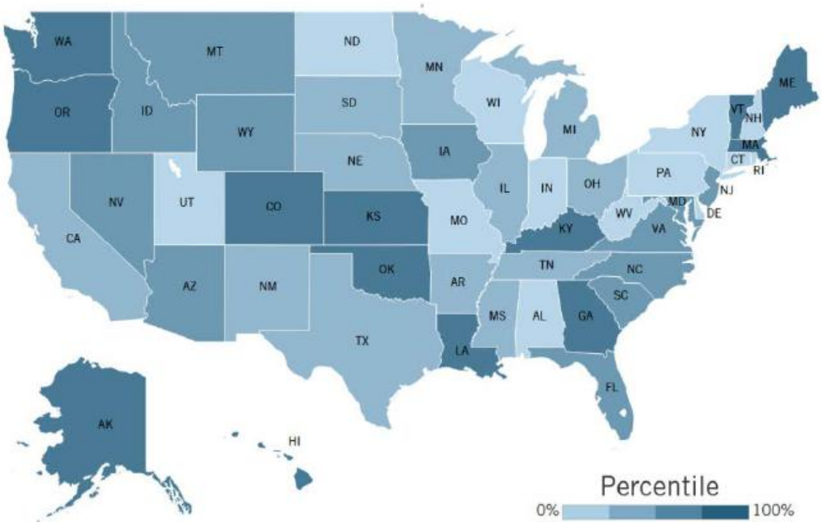
The rankings: With Los Alamos and Sandia National Laboratory accounting for more than 80 percent of New Mexico's non-industry R&D, the state far exceeds any other state in non-industry R&D as a share of GSP at eight times the national average. Maryland ranks second, at nearly six times the national average, building on Department of Defense laboratories, NIH, NIST, and NASA's Goddard Space Flight Center.[67] Of the top five, only in Massachusetts does a majority of non-industrial R&D come from sources other than federal labs, with university R&D making up the lion's share of non-industry R&D performed. Other states with large federal facilities, such as Alabama, Rhode Island, and Virginia also score well.

	The Top Five	R&D as a Percentage of GSP
1	New Mexico	5.8%
2	Maryland	4.1%
3	Massachusetts	1.4%
4	Rhode Island	1.3%
5	Alabama	1.3%
	U.S. Average	0.7%

Source: National Science Foundation, 2014

MOVEMENT TOWARD A CLEAN ENERGY ECONOMY

A composite score of the change in energy consumption per capita, renewable energy as a share of total energy consumed, and change in renewable energy's share of total energy consumed



"From 2011 to 2014, energy consumption per capita in the United States fell by 0.8 percent, while renewable energy as a share of total energy consumption grew by 3.1 percent."

Why is this important? Beyond being good for the planet, reduced consumption of carbon-intensive energy sources is an emerging marker of economic vitality. Increasing energy efficiency can lead to lower costs for businesses, governments, and residents, making a state more attractive to live and do business. From 2011 to 2014, energy consumption per capita in the United States fell by 0.8 percent, while renewable energy grew by 3.1 percent as a share of total energy consumption.[68] Historically, economic growth and energy consumption display a positive relation.[69] But the fall in energy use per capita while the economy recovered suggests more efficient and productive energy use across the economy. Meanwhile, the ever-increasing growth in renewables could be attributed in part to tax credits for investment and adoption of renewable technologies.

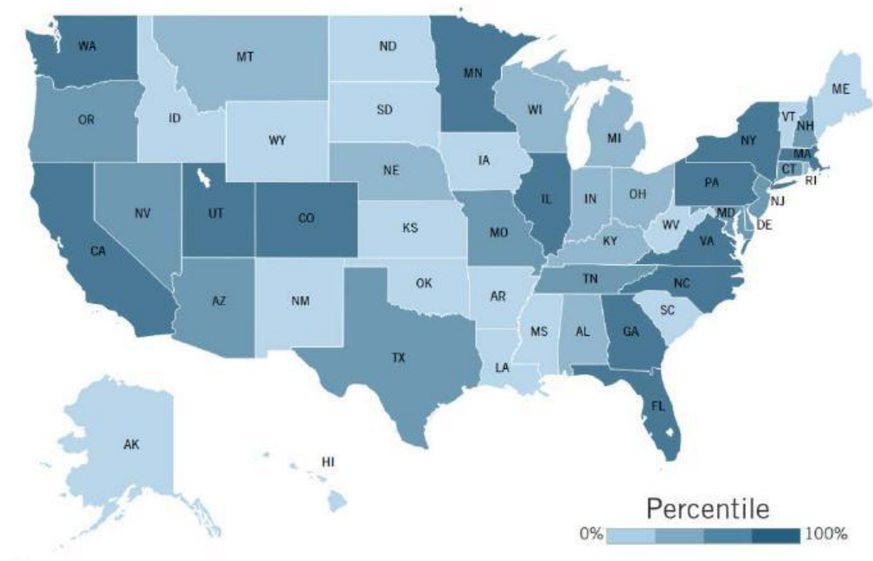
The rankings: On the whole, Kansas, Vermont, Alaska, Hawaii, and Washington lead the movement toward a clean-energy economy. But probing into the components of this indicator, other states show signs of success, too. On per-capita reductions in energy use, the leaders are Vermont, Maryland, and Massachusetts. On the metric of renewables as a share of total energy consumption, the top three are Oregon, Washington, and Maine. And Kansas, Oklahoma, and Alaska have made the biggest strides in shifting their energy consumption toward renewables. From 2011 to 2014, Kansas increased renewables as a share of total energy consumption by 86 percent, 28 times the national average. Washington's and Oregon's high scores on renewables as a share of consumption are due in part to their reliance on hydroelectric power—which, combined with other renewable energy sources, accounts for just under half of their energy use.

	The Top Five	Composite Score
1	Kansas	6.29
2	Vermont	6.22
3	Alaska	5.64
3	Hawaii	5.64
5	Washington	5.63
	U.S. Average	5.00

Source: Energy Information Administration, 2011, 2014

VENTURE CAPITAL

The amount of venture capital invested as a share of gross state product



"Alongside the economic recovery, venture capital investment nearly tripled from 2009 to 2016, peaking at $74 billion in 2015."

Why is this important? Venture capital is an important source of funding for new, fast-growing entrepreneurial companies, as venture capitalists' goal is often to identify promising innovations and help bring them to the marketplace. Firms that got their start this way contribute an outsized share of American innovation. Indeed, among publicly traded companies, those founded after 1974 with VC backing now employ 38 percent of workers but account for 85 percent of business R&D.[70] Venture capital funding peaked in 2000 at $105 billion, in the midst of the tech boom, and then dropped precipitously after the tech bubble burst, to just $17 billion in 2003.[71] It then increased slowly until the Great Recession when it dropped again. With the subsequent economic recovery, venture capital investment nearly tripled from 2009 to 2016, peaking at $74 billion in 2015.[72]

The rankings: In 2016, 64 percent of all venture capital went to California and Massachusetts. Each receives nearly four times more venture capital as a share of gross state product than the average state. Both states not only have a robust VC industry, but also strong university engineering and science programs and an existing base of high-tech companies, both of which can be the source of entrepreneurial start-ups or spinoffs that receive VC funding.

	The Top Five	Venture Capital as a Percentage of GSP
1	California	1.28%
2	Massachusetts	1.27%
3	New York	0.52%
4	Virginia	0.45%
5	Utah	0.43%
	U.S. Average	0.33%

Source: PricewaterhouseCoopers, 2016

POLICY IMPLICATIONS: INVESTMENT, TAXES, START-UPS, AND FIRM SIZE

State economic development policy is as much an art as it is a science. We see this in the fact that what is viewed as the right policy framework can differ significantly over time. Sometimes policies, or views about what the right policies are, change because economic circumstances change. But often they change for no other reason than because a new idea comes into fashion and policymakers scramble to embrace it. The idea may be that small business is key and that policymakers should nurture start-ups by "gardening" with tools such as incubators and accelerators. It may be to focus on attracting the so-called "creative class." Or it may be to embrace "green" growth and development in the so-called "circular" economy, which is all about extracting maximum value from resources by finding ways to reuse and recycle products and materials after their initial lifespans. At the same time, state officials differ significantly in the extent to which they believe low taxes or substantial public investment are important to growth, with some states focusing more on the former and others on the latter.

Ideally, the practice and conception of economic development should be immune, if not at least resistant, to faddish thinking and practices. But all too often it is not. This edition of the *State New Economy Index* delves into two areas where clearer thinking, or at least analysis, is needed.

TAXES, INVESTMENT AND ECONOMIC DEVELOPMENT

The first is the relationship between taxes, spending, and the business climate. Here the issues are less about fads than ideological strictures, with different camps firmly believing their way is best. Some, usually on the right, hold that the key to prosperity is unshackling noble and hard-working "entrepreneurs" (which could include everyone from a software engineer with a vision for the next new thing to a local mom-and-pop pizza parlor) from the burden of government, especially taxes. In contrast, some on the left believe that only the generous hand of the state can create a just society by investing public resources in economic development initiatives targeted toward struggling populations and regions. For them, prosperity per se is sometimes not the goal, because some believe that creating wealth contributes to global warming and question whether productivity growth really benefits average workers.[73]

In fact, the relationship between taxes, spending, and investment for economic development is much more complicated. The ideal state economic policy doesn't exist. It would be one in which all tax revenues come from the federal government through transfer payments (or from natural resource royalties) so that state taxes on businesses and individuals could be cut to zero. At the same time, much of those "free" taxes would be invested in infrastructure, education, R&D, and tech transfer. Who wouldn't want live and do business in such a state, all else equal? Alas, in the real world, states must figure out how to raise and spend revenues themselves. And they face several big choices, starting with how much tax revenue to raise and how to raise it (particularly how much should come from corporate taxes), and then how to spend it (particularly how much to devote to investment).

States differ significantly in their approaches to making these choices. To briefly illustrate the interaction between taxes and investment, ITIF developed a simple matrix to group states into one of four categories: high-tax, high-investment; high-tax, low-investment; low-tax, low-investment; or low-tax, high-investment. (See figure 1 for scatterplot of investment-tax matrix and table 1 list of states in each category.)

- Our method was to classify states as above or below average on taxes, and above or below average on investment.
- The tax measurement is made up of three standardized variables: corporate tax revenue as a share of gross state product, the maximum corporate income tax rate, and total tax revenue as a share of gross state product. These variables are weighted at 26.6 percent, 40 percent, and 33.3 percent, respectively, then summed. The tax data comes from the National Association of State Budget Officers and Tax Foundation.[74] (And our model assumes that, all else being equal, corporate taxes have a larger negative impact on growth than taxes on non-mobile sources of income, such as sales taxes.)
- Investment is defined as activities that produce future economic prosperity, including state and local spending on primary through higher education, infrastructure (transportation, utilities, and sewage), and economic development programs. We sum these investments and express them as a share of gross state product using data from the Urban Institute and the Council for Community and Economic Research.[75]

Clearly no state should want to be in the high-tax, low-investment quadrant. In an increasingly competitive global economy, lower costs for business can provide a competitive advantage. And investment in public goods like education and economic development helps companies be more competitive and produce more, and it makes a state better at developing, attracting, and retaining knowledge workers. That said, three types of states are in this quadrant. The first are "price makers"—states like California, Massachusetts, and Washington, which are doing so well economically, and enjoying so many inherent advantages, that they can "afford" higher taxes and lower investment. These states are "seedbeds of innovation," with many high-tech companies and strong universities, so high costs are less deleterious than they would be if their economies were more focused on routine production that is more cost-sensitive.

Next in the high-tax, low-investment quadrant are "satellite" states that benefit from being next to or part of major innovation hubs and so can also afford higher costs and less investment without suffering serious economic harm. New Hampshire has the good fortune to be adjacent to Massachusetts and enjoys being home to not just the high-income commuters to Boston's Route 128 corridor, but also the high-tech companies that are peripherally connected to the Route 128-495 orbit. Moreover, significant parts of Connecticut's economy benefit from being next to New York City, with nearby financial services and corporate headquarters in the southeast. Likewise, Delaware benefits from being next to the vibrant metro areas of Philadelphia and Washington, D.C. In Idaho, neither of these factors exist, and it normally might be considered a low-tax state, low-investment state, but its above-average corporate tax rate puts it in the high-tax category.

In contrast, the states that are best positioned economically, at least in theory, have lower taxes and higher investment. In this quadrant, there are 10 states that fall into three groupings. States in one group are lucky to have hydrocarbons under their soil, so the mineral excise taxes allow other taxes, especially on business, to be kept relatively low. These include Alaska, Louisiana, North Dakota, and Wyoming. Like the "satellite" states in the high-tax, low-investment quadrant, these states are fortunate in their geographic locations.

Figure 1: Classification of States by Tax and Investment Patterns Compared to the National Average

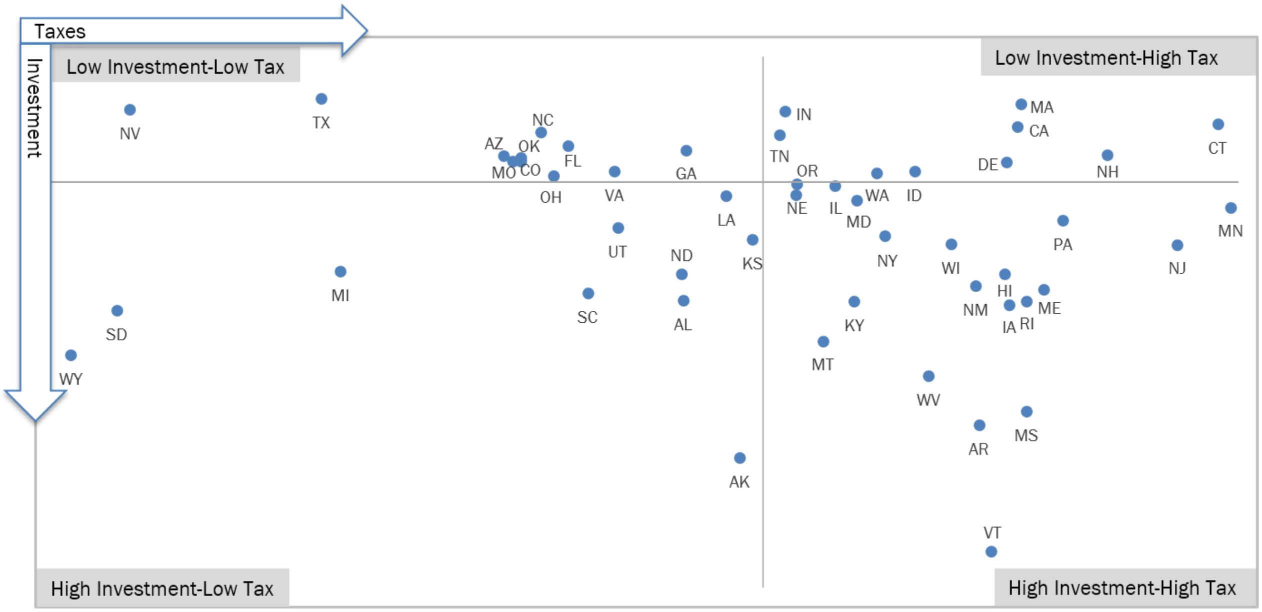


Table 1: Classification of States by Tax and Investment Patterns Compared to the National Average

	Low Taxes		High Taxes	
Low Investment	Arizona	North Carolina	California	Massachusetts
	Colorado	Ohio	Connecticut	New Hampshire
	Florida	Oklahoma	Delaware	Washington
	Georgia	Tennessee	Idaho	
	Indiana	Texas		
	Missouri	Virginia		
	Nevada			
High Investment	Alabama	North Dakota	Arkansas	Nebraska
	Alaska	South Carolina	Hawaii	New Jersey
	Kansas	South Dakota	Illinois	New Mexico
	Louisiana	Utah	Iowa	New York
	Michigan	Wyoming	Kentucky	Oregon
			Maine	Pennsylvania
			Maryland	Rhode Island
			Minnesota	Vermont
			Mississippi	West Virginia
			Montana	Wisconsin

A second category of low-tax, high-investment states are those in the South that have long sought to keep business costs low but have coupled this with a focus on public spending to drive economic development, including on education and economic development programs. These include Alabama and South Carolina. To this category can be added Michigan, which for decades was like a midwestern state, likely above average for both investment and taxes, but in recent years has copied the Sunbelt's playbook and focused on cutting taxes.

Third are Plains and Mountain states that have long been focused on low taxes, but which have expanded public investment to help drive growth, particularly technology-based growth. Kansas and South Dakota both invest more than the national average, in part because they, like Alabama, Michigan, and South Carolina, invest more than the national average in state economic development. Utah invests more overall, but not by a significant amount.

The next quadrant includes 13 states that keep taxes below average but also invest less than the national average. These are almost all in the South and West. These are states that have less ability to charge higher "prices" and still be competitive, but they also don't place as much priority on public investment as a driver of growth.

Within this category there are several natural groupings. Arizona, Florida and Nevada are dependent to a large degree on retirement and tourism and therefore have felt less need for more robust public investment. Also here are traditional southern or southwestern states that have remained committed to the model of low costs, including Georgia, North Carolina, Oklahoma, Tennessee, Texas, and Virginia. All six of those states have made some attempts at more robust investments, including in higher education and technology-based economic development, but they still rank below average on investment, in part because some, such as Georgia and North Carolina, have cut back in recent years. Midwest states of Indiana and Ohio meanwhile have sought to become more cost-competitive, especially compared to southern states, but they still invest less, including in economic development. Missouri and Colorado also are in this category.

In the final quadrant, 20 states are above average in both taxes and investment. The theory for these states is that high investment levels make it worthwhile to locate or expand there, despite the high taxes. And while this is true for some states, it is not true for others.

The states in this high-tax, high-investment quadrant fall into several natural groupings. First, there are traditionally Democratic states that prioritize high levels of public investment but accept higher taxes, including sometimes on business. These include Hawaii, Illinois, Maryland, Minnesota, New York, New Jersey, New Mexico, Pennsylvania, Rhode Island, and Vermont. Next, there is a group of poorer, more conservative states that seek to keep costs low, but because they are poor they have expanded investments as a way to catch up. These include Arkansas, Kentucky, Mississippi, and West Virginia. Finally, there are states that understand they need to make significant investments in economic development and other initiatives to maintain competitiveness, but they also have relatively higher taxes. These include Iowa, Maine, Montana, Oregon, Nebraska, and Wisconsin.

SMALL BUSINESS: THE SOURCE OF ECONOMIC DEVELOPMENT SUCCESS?

Most state and local economic development analysis is conducted at the industry level, often analyzing the industrial composition of a particular region (the mix of manufacturing, financial services, tourism, etc.). Seldom does an analysis examine firm size. In other words, what share of a region's economy is made up of large firms versus small firms, and what does that mean for future growth? Perhaps one reason for this lack of focus on firm size is that there are considerable differences in view as to which firms contribute more a region's economy: big or small.

The "small is beautiful" advocates would advise economic development officials that states and regions with more small firms are economically healthier than those with large ones. Small firms, according to this narrative, are the font of innovation and job creation, and they have a greater multiplier effect on regional economies. For these advocates, including small business lobbying groups, states that have higher rates of new business formation are more "entrepreneurial" and therefore better positioned economically.[76] This view has become widely accepted in policymaking circles, particularly in the last decade.

But it turns out this conventional wisdom is wrong, as Robert D. Atkinson and Michael Lind show in a forthcoming book titled *Big is Beautiful: Rebutting the Mythology of Small Business* (MIT Press, 2018). On virtually every economic indicator, including wages, innovation, exports, and even job creation, large firms in the United States outperform small ones. Moreover, states with larger average firm sizes outperform states with smaller firms. As such, any economic development policy focused on boosting the welfare of a state's workforce cannot afford to be indifferent to firm size.

The larger the share of a state's employment coming from jobs in large firms, the richer it is. States with a higher share of jobs in small businesses have on average, lower per-capita incomes. There is a negative correlation (0.27) between the share of jobs in a state in firms with fewer than 20 employees and the state's per-capita income. For example, in Montana, where 31 percent of jobs are in small firms, the per-capita income is just $39,800. In Massachusetts, where just 16 percent of jobs are in small firms, per-capita income is $62,900.[77]

This wage difference between small and large firms is not new: As far back as 1890 when the U.S. Census Bureau first collected the data, large manufacturers paid their workers more than small ones did.[78] Nor is the difference a regional aberration. In 2015, workers employed by large firms across the United States earned on average 54 percent more than workers in companies with fewer than 100 workers.[79] And nor is the pattern confined to any particular sector of the economy. For example, a 2014 study from researchers at Stanford and the University of Michigan found that large chain retailers like Walmart "pay considerably more than small mom-and-pop establishments. Moreover, large firms and large establishments give access to managerial ranks and hierarchy."[80]

One reason large firms provide better wages is that large firms invest more in machinery and equipment and workforce training, so they have higher productivity.[81] In contrast to the prevailing narrative, large firms are also more innovative. Small business advocates often argue that small firms make up for lower productivity with more innovation. But this is not the case. While small firms account for 49 percent of U.S. employment, they account for just 16 percent of business spending on research and development, while firms of more than 25,000 workers account for 36 percent.[82] Likewise, small firms account for 18.8 percent of patents issued, while the largest firms account for 37.4 percent.[83]

Large companies also are better for budget officials worried about keeping state governments solvent. The reason is not only that large businesses are more productive and pay higher wages, but that they are more likely to pay their taxes. For example, according to Jane Gravelle, a tax policy expert for the Congressional Research Service, the underreporting rate for proprietorship income is

57 percent, contrasted with a rate of less than 20 percent for large and medium-sized corporate businesses.[84] In other words, small businesses report only 43 of their actual income, compared to 80 percent for medium and big businesses.

Even with all these advantages for large firms, defenders of small firms tend to fall back on the job creation card, claiming that small firms may not be as productive, but they create more jobs. Ever since economist David Birch wrote in the late 1970s that small business is the job engine for the economy, this received wisdom has taken on mythic proportions, to the point where it is no longer even questioned. But in fact, it isn't true.

One reason for the confusion about job creation is that small businesses (or *new* businesses, to be more specific) do, in fact, create a lot of jobs—but they also quickly destroy a lot of jobs as they fail. One study concluded that the smallest firms generate a slightly greater share of new jobs than their overall share of jobs (35.1 percent versus 27.2 percent), but "there is stronger evidence that the smallest firms also generate a disproportionate share of gross job destruction (33.9 percent, relative to the 27.2 percent employment share)."[85] This is why there is a strong correlation between start-up and failure rates across industries (0.77 at the 3-digit industry code level). In other words, the industries that have the highest rates of firms starting up also have the highest rates of firms failing.[86] Another study rightly concludes that "a common confusion between net and gross job creation distorts the overall job creation picture and hides the enormous number of new jobs created by large employers."[87]

But what about start-ups, the supposed source of American economic renewal? It turns out that most start-ups don't actually create that many net jobs, either. As MIT's Scott Shane has found, "only 1 percent of people work in companies less than two years old, while 60 percent work in companies more than 10 years old."[88] One reason is that most small business owners have no desire to grow their firms. Nearly three-quarters of individuals who start businesses want to keep them small.[89] Surveys show that the lion's share of people who start businesses do so not because they want to be rich entrepreneurs, something that takes almost mindless dedication and hard work to achieve; rather, most simply don't want to work for a boss.[90]

So, what determines whether a state economy thrives, including impacts on the unemployment rate, is not whether Justin's clothing shop on Main Street sells more pants. It is whether the companies that export goods and services and compete in tough international markets do well. And more often than not, that means big firms. In fact, among the small firms that remain viable, many are dependent on large firms as their customers. As Bennett Harrison wrote, "Many du jure independent small companies turn out in varying degrees to be de facto dependent on the decisions made by managers in the big firms on which the smaller ones rely for markets, for financial aid, and for access to political circles."[91] We see this, for example, in the fact that Boeing, the leading aerospace company, spent $5 billion with U.S. small businesses suppliers in 2016 representing approximately 50,000 jobs.[92]

So, what does this all mean for economic development policy? First, it means that states should rethink their often-reflective policies favoring small businesses. To the extent state economic development policies give some kind of preference to small firms, they should do so because they are either in export-based industries (e.g., small manufacturers) or because they have the potential to become high-growth “gazelles” (e.g., high-tech spin offs from a state university). But states should eliminate policies designed to help run-of-the-mill small “entrepreneurs.”

States with below-average top marginal income tax rates on individuals should increase them, because they benefit mostly higher-income individuals, including small business owners. States should use that revenue to cut corporate income taxes and boost innovation incentives for activities such as R&D or capital investment. The former would help attract and retain larger, more productive corporations and the latter would help more firms, regardless of corporate form, to become more productive and innovative. More generally, states should make all of their tax policies firm-size neutral—for example, by ensuring that any tax preferences available to small firms are also available to large firms.

States should eliminate government procurement preferences targeted at small firms. At least 20 states favor small business in their procurement rules, and 34 have some kind of preference that requires small-business certification.[93] By directing procurement officials not to buy the products and services that are the best values, these preferences raise costs for government, which hurts regional competitiveness. States also should reduce small business lending that does not serve some distinct purpose, such as boosting exports outside a state.

These policies would not be a panacea. But at the margin, embracing size neutrality in state economic policies should produce marginally higher rates of growth over time, depending on the extent to which states’ current policies are stacked in favor of small firms.

CONCLUSION

States that score well in the *State New Economy Index* are best positioned to face the challenges associated with the innovation-driven New Economy, while lower-scoring states have significant ground to make up. While low-scoring states would benefit most from implementing comprehensive innovation strategies, high-scoring states also have room for improvement. Indeed, all the states, and perhaps most importantly, the federal government, need innovation strategies to compete in the New Economy. Successful strategies will incentivize, among other things: having a workforce and jobs based on higher skills; strong global connections; dynamic firms, including strong, high-growth start-ups, industries, and individuals embracing digital technologies; and strong capabilities in technological innovation. Without these, virtually every state in the country will find itself stuck in the economic doldrums, unable to reap the job growth and quality of life improvements that the New Economy enables.

APPENDIX: INDEX METHODOLOGY

As with previous editions, the *2017 State New Economy Index* controls for a state's industry-sector mix when considering variables that measure company behavior: R&D, exports, patents, and manufacturing value added. Holding the industry mix constant is important because some industries inherently invest more in R&D, export more, produce more patents, or are more productive than other industries. For example, without controlling for industry mix, the state of Washington would score very high in manufacturing exports because its aviation sector is so large relative to the rest of its economy, and exports are a large share of an aviation industry's output. Accounting for a state's industrial composition presents a more accurate measure of the degree to which companies in a state, irrespective of the industry they are in, export, invest in R&D, or patent. Similarly, manufacturing value added is measured on a sector-by-sector basis, ensuring that a state's companies are compared to the nationwide performance of firms in the same industry. Industry mix is controlled for on the following indicators: manufacturing value added, export focus of manufacturing and services, patents, and industry investment in R&D.

Because each *State New Economy Index* since 1999 has used slightly different indicators and methodologies, the total scores are not directly comparable year-to-year. Therefore, a state's movement to a higher or lower overall rank between editions may not positively reflect actual changes in its economic structure. In all cases, the report relies on the most recently published statistics available; however, because of the delays in publishing federal statistics, some data may be several years old. Where applicable and appropriate, raw data is normalized to control for factors such as state population, GSP, etc.

To measure the magnitude of the differences between the states instead of just their rank from 1 to 50, raw scores for each indicator are standardized. Weights for each indicator are determined according to their relative importance. To produce the section scores, the standardized indicators scores under each section are multiplied by their respective weights, summed, and then each increased by a score of 10. The overall score is calculated by first summing the maximum score of each section to determine a "maximum potential overall score." The overall score for each state is then the sum of the state's score on each section, which is expressed as a percentage of the maximum potential overall score.

INDICATOR WEIGHTS

Indicator	Weight
Knowledge Jobs	**5.00**
Information Technology Jobs	0.75
Managerial, Professional, and Technical Jobs	0.75
Workforce Education	1.00
Immigration of Knowledge Workers	0.50
Internal Migration of U.S. Knowledge Workers	0.50
Manufacturing Value Added	0.75
High-Wage Traded Services	0.75
Globalization	**2.25**
Foreign Direct Investment	0.75
Export Focus of Manufacturing and Services	0.75
High-Tech Exports	0.75
Economic Dynamism	**3.00**
Business Churning	0.75
Fast-Growing Firms	1.00
Initial Public Offerings	0.75
Inventor Patents	0.50
The Digital Economy	**2.50**
Online Agriculture	0.50
E-government	0.50
Broadband Telecommunications	1.00
Health IT	0.50
Innovation Capacity	**5.00**
High-Tech Jobs	0.75
Scientists and Engineers	0.75
Patents	0.75
Industry Investment in R&D	1.00
Non-Industry Investment in R&D	0.50
Movement Toward a Clean Energy Economy	0.50
Venture Capital	0.75

INDICATOR METHODOLOGIES AND DATA SOURCES

This section uses the following abbreviations:

SOC: Bureau of Labor Statistics (BLS) 2010 Standard Occupational Classification. The BLS classifies workers based on their job descriptions into four nested occupation categories, with 840 occupational categories at the most detailed level and 23 occupational at the broadest level. The BLS will release the next revision for this classification system in 2018. For more information, see: https://www.bls.gov/soc/.

NAICS: 2012 North American Industry Classification System. This system classifies a business based on how it generates the majority of its revenue into five nested industry categories, with 1,065 industries at the most detailed level and 20 industries at the broadest level. The 2017 NAICS revision takes effect this year. For more information, see: https://www.census.gov/eos/www/naics/.

INFORMATION TECHNOLOGY JOBS

Description: IT jobs in non-IT industries as a share of private, non-IT-sector employment.

Methodology: IT jobs include SOC 15-000 (computer and math occupations) and 11-3021 (computer and information systems managers). Private non-IT sectors include all NAICS industries except 334 (computer and electronic manufacturing), 5112 (software publishers), 5415 (computer systems design and related services), and 92 (federal, state, and local government).

Data Sources:

Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data estimates, by State and Industry; accessed May 1, 2017), https://www.bls.gov/oes/2016/may/oes_research_estimates.htm.

Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data, Research estimates by state and industry, Sector 99: Federal, State, and Local Government, excluding state and local schools and hospitals, and the U.S. Postal Service (OES Designation); accessed April 27, 2017), https://www.bls.gov/oes/special.requests/oes_research_2016_sec_99.xlsx.

MANAGERIAL, PROFESSIONAL AND TECHNICAL JOBS

Description: Managerial, professional and technical jobs as a share of private-sector employment.

Methodology: Managerial, professional and technical jobs include SOC 11-0000, 13-0000, 15-0000, 17-0000, 19-0000, 21-0000, 23-0000, 25-0000 (except 25-2011, 25-9031, 25-9041), 27-0000 (except 27-1023, 27-1025, 27-1026, 27-2022, 27-2023, 27-2031, 27-2032, 27-2041, 27-2042, 27-3011, 27-3012, 27-3091, 27-4021), 29-0000, 41-3031, 41-4011, 49-1011, 49-2011, 49-2022, 49-2091, 49-2094, 49-2095, 49-3011, 49-3041, 49-3052, 49-9041, 49-9052, 51-4012, and 53-2021.

*Note: In previous editions, this variable was expressed as a share of total employment instead of private-sector employment.

Data Sources:

Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data estimates, by State; accessed April 27, 2017), https://www.bls.gov/oes/special.requests/oesm16st.zip.

Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data, Research estimates by state and industry, Sector 99: Federal, State, and Local Government, excluding state and local schools and hospitals, and the U.S. Postal Service (OES Designation); accessed April 27, 2017), https://www.bls.gov/oes/special.requests/oes_research_2016_sec_99.xlsx.

WORKFORCE EDUCATION

Description: A weighted score of the adult population's educational attainment.

Methodology: A state's population aged 25 years and older is divided into seven education attainment categories: no high school diploma, high school diploma, some college (one or more years, no degree), associate's degree, bachelor's degree, master's or professional school degree, and doctorate degree are calculated. The population in each of these categories is expressed as a share of total population across these six categories and multiplied by their respective weights: -0.05 for no high school diploma, 0.00 for high school diploma, 0.25 for some college, 0.50 for associates degree, 1.00 for bachelor's degree, 1.50 for master's or professional degree, and 2.00 for doctorate degree. The six weighted values are summed for a final score.

Data Sources:

Census Bureau, 2015 American Community Survey 1-year Estimates (B15003: educational attainment for the population 25 years and over; accessed November 17, 2016), https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

IMMIGRATION OF KNOWLEDGE WORKERS

Description: A weighted score of the foreign born population's educational attainment.

Methodology: A state's population of immigrants from abroad aged 25 and older is divided into five education attainment categories: less than high school graduate, high school graduate (includes equivalency), some college or associate's degree, bachelor's degree, or graduate or professional degree. The population in each of these categories is expressed as a share of total population across these five categories and multiplied by their respective weights: -0.50 for less than high school graduation, 0.00 for high school graduate (includes equivalency), 0.40 for some college or associate's degree, 1.00 for bachelor's degree, and 1.65 for graduate or professional degree. The five weighted values are summed for a final score.

Data Sources:

Census Bureau, 2015 American Community Survey 1-year Estimates (B07009: geographical mobility in the past year by educational attainment for current residence in the United States; accessed November 17, 2016), https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

INTERNAL MIGRATION OF U.S. KNOWLEDGE WORKERS

Description: A weighted score of educational attainment of migrant population from other U.S. states.

Methodology: A state's population of immigrants from other states aged 25 and older is divided into five education attainment categories: less than high school graduate, high school graduate (includes equivalency), some college or associate's degree, bachelor's degree, or graduate or professional degree. The population in each of these categories is expressed as a share of total population across these five categories and multiplied by their respective weights: -0.50 for less than high school graduation, 0.00 for high school graduate (includes equivalency), 0.40 for some college or associate's degree, 1.00 for bachelor's degree, and 1.65 for graduate or professional degree. The five weighted values are summed for a final score.

Data Sources:

Census Bureau, 2015 American Community Survey 1-year Estimates (B07009: geographical mobility in the past year by educational attainment for current residence in the United States; accessed November 17, 2016), https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

MANUFACTURING VALUE ADDED

Description: Manufacturing value added per production hour worked, adjusted for industry mix.

Methodology: Value added per production hour is calculated for each four-digit NAICS industry within the manufacturing sector (NAICS 31-33) for each state. Where current year data is unavailable, previous-year data is used as a proxy. Where neither current year nor previous year data is available, unavailable data is calculated as an aggregate "remainder" by subtracting available data from the total of the parent industry (one digit up—for example, the parent industry of NAICS 3329 is NAICS 332). Value added per hour for each four-digit industry with available data in each state is then expressed as a ratio to value added per hour for the same industry on the national level. Each ratio is then multiplied by employment (either current year or previous year, depending on the ratio's year) in its respective four-digit industry for each state, which is then summed across industries in each state to determine the level of manufacturing employment the state would be expected to have in order to produce the same level of value added but with manufacturing labor productivity (value added per hour) equal to the national baseline ("expected available employment").

The aggregate "remainders" for each state are used to determine equivalent remainders on the national level where the United States is missing the same industry data as each state. Value added per hour for each state remainder is then expressed as a ratio to value added per hour for the equivalent remainder on the national level. Each ratio is then multiplied by employment in the remainder for each state, which is then summed across the remainders for each state ("expected remainder employment"). The share of each state's manufacturing employment contained within its remainders is calculated ("remainder share"). Because the accuracy of the remainder estimates decrease as the size of the remainders increase, both expected remainder employment and actual remainder employment are multiplied by unity minus the remainder share, such that the influence of the remainders on each state's final score decreases as uncertainty about remainder precision increases ("adjusted expected remainder employment" and "adjusted actual remainder employment"). Adjusted expected remainder employment is summed with expected available employment for each state. Adjusted actual remainder employment is likewise summed with actual available employment.

For each state, the summed expected employment is divided by summed actual employment and multiplied by the national value for manufacturing value added per production hour worked for the final value.

Data Sources:

U.S. Census Bureau, 2015 Annual Survey of Manufactures (AM1531AS101: geographic area statistics, statistics for all manufacturing by state, 2015 and 2014; AM1531GS101: general statistics, statistics for industry groups and industries, 2015 and 2014; accessed February 27, 2017), https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

HIGH-WAGE TRADED SERVICES

Description: Employment in traded service sectors that pay above the national median service-sector wage as a share of service-sector employment.

Methodology: The median of the average weekly wages of 73 traded service industries is calculated at the national level. (This value is $1,378 for 2015 data.) These 73 industries, as classified by NAICS, are: **4251**, **4811**, **4812**, 482111, **4831**, 48412, 4842 (excluding 48422), 4852, 4855, **4861**, **4862**, **4869**, 4871, 4872, 4879, 4881, 4882, **4883**, 4884, 4885, 4889, 4931, **51112**, **51113**, **51114**, 51119, **5121 (excluding 51213)**, **5122**, **5152**, **5191 (excluding 51912)**, 5221, **5222**, **5223**, **5231**, **5232**, **5239**, **5241**, **5251**, **5259**, 5321, **5331**, **5411**, 5412, **54131**, 54132, 54134, **54136**, 54137, 5414 (excluding 54141), **5416**, **5418**, **54199**, **54191**, **5511**, 5614, 6113, 61143, 6117, 7111, 7113, **7114**, **7115**, 7121, 71311, 7132, 7211, 7212, 8132, 8133, **81391**, **81392**, 81393, and 81394. (**Bolded** industries have an average weekly wage higher than the median.)

Total employment in the 36 **bolded** industries is expressed as a share of total service-sector employment (NAICS 42, 44-45, 48-49, 51, 52, 53, 54, 55, 56, 61, 62, 71, 72, and 81). Unavailable data is estimated using prior years' data.

Data Sources:

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (various series IDs, 2015; accessed November 17, 2016), http://www.bls.gov/cew/.

FOREIGN DIRECT INVESTMENT

Description: Employment in majority-owned foreign companies as a share of private-sector employment.

Methodology: Employment in majority-owned U.S. affiliates of foreign multinational corporations is expressed as a share of total private-sector employment.

*Note: This edition updates the methodology to use total private-sector employment instead of total employment.

Data Sources:

Bureau of Economic Analysis, International Data (foreign direct investment in the United States, data on activities of multinational enterprises, majority-owned bank and nonbank U.S. affiliates, employment, by state, 2014; accessed May 1, 2017), https://www.bea.gov/iTable/iTable.cfm?ReqID=2&step=1#reqid=2&step=1&isuri=1.

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (various series IDs, private sector employment, by state; accessed May 1, 2017), http://www.bls.gov/cew/.

EXPORT FOCUS OF MANUFACTURING AND SERVICES

Description: Value of manufacturing and services exports per manufacturing and service worker, adjusted for industry mix.

Methodology:

At both the national level and state level, gross export value per employee is calculated for 29 industries (NAICS 311, 312, 313, 314, 315, 316, 321, 322, 323, 324, 325, 326, 327, 331, 332, 333, 334, 335, 336, 337, 339, 511, 518, 519, 5411, 5413, 5415, 5416, 5417). State-level data for services exports, where latest data is from 2012, is adjusted by the average national increase in service exports to derive an estimated 2015 services export value. Gross exports per employee for each industry at the state level is expressed as a ratio to gross exports per employee for each industry at the national level. Each ratio is multiplied by employment in its respective industry at the state level to obtain each state's expected employment adjusted for industrial mix. Expected employment and actual employment are summed across industries for each state. The summed expected employed is then divided by the summed actual employment and multiplied by the national value of gross manufacturing and services exports per manufacturing and service worker for the final value.

Data Sources:

U.S. Census Bureau, USA Trade (NAICS district-level data, by state, 2015; accessed May 2, 2017), https://usatrade.census.gov/.

U.S. Census Bureau, American Fact Finder (Economic Census 2012: Series: EC1251SXSB1, EC1254SXSB1, EC1256SXSB1, EC1271SXSB1; accessed May 2, 2017), https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (various series IDs, private sector; accessed May 2, 2017), http://www.bls.gov/cew/.

HIGH-TECH EXPORTS

Description: The value of high-tech goods and services exports as a share of gross state product.

Methodology: See ITIF report: *High-Tech Nation: How Technological Innovation Shapes America's 435 Congressional Districts*, https://itif.org/publications/2016/11/28/technation.

BUSINESS CHURNING

Description: The number of business establishment start-ups and failures as a share of total private establishments, averaged over two years.

Methodology: Private establishment births and deaths are summed across all quarters for both the current year (2015) and the prior year (2014). This value is divided by the total number of private establishments in both these years.

*Note: Previous editions used openings and closings; births and deaths more accurately measures new businesses starting up and shutting down.

Data Sources:

Bureau of Labor Statistics, Business Employment Dynamics (establishment births, establishment deaths, establishments, total private, 2014, 2015; accessed April 27, 2017), http://www.bls.gov/bdm/.

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (number of establishments, private, 2014, 2015; accessed April 27, 2017), http://www.bls.gov/cew/.

FAST-GROWING FIRMS

Description: The average number of firms on the "Inc. 5000" list over the past two years as a share of total firms.

Methodology: The number of firms found on Inc. 5000 list for the two most recent years (2015 and 2016) are summed and averaged. This average is divided by the total number of firms (2014).

Data Sources:

"2016 Inc. 5000," *Inc.*, 2016, accessed February 20, 2017, https://www.inc.com/inc5000/list/2016/.

"2015 Inc. 5000," *Inc.*, 2015, accessed February 20, 2017, https://www.inc.com/inc5000/list/2015/;

U.S. Census Bureau, Statistics of U.S. Businesses (2014 SUSB Annual Data Tables, U.S. & states, totals; accessed February 20, 2017), https://www.census.gov/data/tables/2014/econ/susb/2014-susb-annual.html.

INITIAL PUBLIC OFFERINGS

Description: A composite score of the value of and number of initial public stock offerings as a percentage of workers' income.

Methodology: This indicator comprises of two variables using data from 2014 to 2016. The first variable sums up the total value of IPOs (in millions) over the most recent three years and divides that value by total personal income (in millions) over the same period. The second variable counts the number of IPOs over the most recent three years and expresses that value as a ratio to total personal income over the same period. Both variables are standardized separately, then the first weighted at 0.7 and the second 0.3. The two weighted scores are summed to obtain a final score for each state.

*Note: The 2017 SNEI uses a different primary data source for IPO data than previous editions.

Data Sources:

IPO Monitor, Recent IPO Filings (IPOs filed in 2014, 2015, 2016; accessed February 20, 2017), https://www.ipomonitor.com/pages/ipo-filings.html?start=1&max=1000.

Bureau of Economic Analysis, Regional Data (annual state personal income and employment, 2014, 2015, 2016; accessed April 28, 2017), http://www.bea.gov/regional/index.htm.

INVENTOR PATENTS

Description: The number of independent inventor patents as a share of the adult population.

Methodology: Patent counts from independent inventors for the current year (2015) and prior year (2014) are averaged and expressed as a ratio to the state population (2014) aged 18 years and above (in thousands).

Data Sources:

U.S. Patent and Trademark Office, Patent Technology Monitoring Team (independent inventors by state by year: utility patents report, 2015, 2014; accessed April 27, 2017), http://www.uspto.gov/web/offices/ac/ido/oeip/taf/inv_utl.htm;

Census Bureau, State Population by Characteristics Datasets: 2010-2016, population 18+, 2015; accessed April 27, 2017), https://www2.census.gov/programs-surveys/popest/datasets/2010-2014/state/asrh/scprc-est2014-18+pop-res.csv.

ONLINE AGRICULTURE

Description: A composite score of the percentage of farms that use computers for business and with Internet access.

Note: Due to data collection methodology, these state groupings are assumed to have the same values: Arizona and Nevada; Delaware and Maryland; Connecticut, Maine, and Massachusetts; and New Hampshire, Rhode Island, and Vermont. Alaska and Hawaii, being excluded from this survey, are assumed to have the average U.S. value.

Methodology: The percentage of farms that use computers for business and the percentage of farms with Internet access for each state are standardized, weighted by 0.5 each, and then summed for the final score.

Data Sources:

U.S. Department of Agriculture, Economics, Statistics, and Market Information System (national agricultural statistics service, farm computer usage and ownership, 2015; accessed April 27, 2017), http://usda.mannlib.cornell.edu/usda/current/FarmComp/FarmComp-08-19-2015.zip.

E-GOVERNMENT

Description: An index that scores a state government's use of digital technologies.

Methodology: Alphabetical grades are extracted from the Digital States 2016 Survey. Alphabetical grades for each state are converted to numerical scores (A=100.0, A- = 96.7, B+ = 93.3, B = 90.0, B- = 86.7, C+ = 83.3, C = 80.0, C- = 76.7).

Data Sources:

Janet Grenslitt, "Digital States Survey 2016 Results" (Center for Digital Government, September 19, 2016), http://www.govtech.com/cdg/digital-states/Digital-States-Survey-2016-Results.html.

BROADBAND TELECOMMUNICATIONS

Description: A composite score of home broadband adoption and average internet connection speeds.

Methodology: The percentage of individuals with wired high-speed internet service used at home and the average connection speed (kbps) for each state are standardized separately, weighted at 0.5 each, and then summed for the final score.

Data Sources:

National Telecommunications and Information Administration, Digital Nation Data Explorer (wired high-speed internet service used at home, by state proportion; accessed April 27, 2017), https://www.ntia.doc.gov/files/ntia/publications/ntia-analyze-table.csv;

Akamai, State of the Internet Connectivity Visualizations, (average connection speed (kbps), by state, Q4 2015; accessed April 27, 2017), https://www.stateoftheinternet.com/trends-visualizations-connectivity-global-heat-map-internet-speeds-broadband-adoption.html.

HEALTH IT

Description: A composite score of pharmacies that can prescribe drugs electronically, hospitals that have basic electronic health record systems, and hospitals that have electronic patient engagement.

Methodology: This composite variable is comprised of three indicators: percent of pharmacies and prescribers enabled for electronic prescribing of controlled substances (EPCS), the percent of non-federal acute care hospitals enabled with basic Electronic Health Record (EHR) systems, and the percent of non-federal acute care hospitals where patients can electronically view, download, and transmit their health information.

Each indicator is standardized across all states with the standardized EPCS score weighted at 0.3, the standardized EHR score weighted at 0.4, and the standardized electronic engagement score at 0.3, before being summed to get the composite Health IT score.

DATA SOURCES:

EPCS indicator: Surescripts, *The National Progress Report on E-Prescribing and Interoperable Health Care: Year 2015* (Surescripts, August 2016), http://surescripts.com/news-center/national-progress-report-2015.

EHR indicator: JaWanna Henry, Yuriy Pylypchuk, Talisha Searcy, and Vaishali Patel, "Adoption of Electronic Health Record Systems among U.S. Non-federal Acute Care Hospitals: 2008-2015" (Office of the National Coordinator for Health Information Technology, May 2016), https://dashboard.healthit.gov/evaluations/data-briefs/non-federal-acute-care-hospital-ehr-adoption-2008-2015.php#appendix.

Electronic patient engagement indicator: JaWanna Henry, Yuriy Pylypchuk, and Vaishali Patel, "Electronic Capabilities for Patient Engagement among U.S. Non-Federal Acute Care Hospitals: 2012-2015" (Office of the National Coordinator for Health Information Technology, September 2016), https://www.healthit.gov/sites/default/files/briefs/2015_patient_engagement_data_brief.pdf.

HIGH-TECH JOBS

Description: Employment in high-tech industries as a share of private-sector employment.

Methodology: Employment in 14 high-tech industries (NAICS 3254, 333314, 334, 335, 33911, 517, 5112, 5182, 51913, 54133, 54138, 5417, 61142, 6215) is expressed as a share of total private-sector employment. Undisclosed data is estimated using prior years' data and national averages.

Data Sources:

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (various series IDs, 2015; accessed November 17, 2016), http://www.bls.gov/cew/.

SCIENTISTS AND ENGINEERS

Description: Scientists and engineers as a share of private-sector employment.

Methodology: The total employment of scientists and engineers (SOC 15-1111, 15-1121, 15-1122, 15-1131, 15-1132, 15-1133, 15-1142, 15-2021, 15-2031, 15-2041, 15-2091, 15-2099, 17-2011, 17-2021, 17-2031, 17-2041, 17-2051, 17-2061, 17-2071, 17-2072, 17-2081, 17-2111, 17-2112, 17-2121, 17-2131, 17-2141, 17-2151, 17-2161, 17-2171, 17-2199, 19-1011, 19-1012, 19-1013, 19-1021, 19-1022, 19-1023, 19-1029, 19-1031, 19-1041, 19-1042, 19-1099, 19-2011, 19-2012, 19-2021, 19-2031, 19-2032, 19-2041, 19-2042, 19-2043, and 19-2099) is expressed as a percentage of private-sector employment.

Data Sources: Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data, by State; accessed April 27, 2017), https://www.bls.gov/oes/special.requests/oesm16st.zip.

Bureau of Labor Statistics, Occupational Employment Statistics (May 2016 data, Research estimates by state and industry, Sector 99: Federal, State, and Local Government, excluding state and local schools and hospitals, and the U.S. Postal Service (OES Designation); accessed April 27, 2017), https://www.bls.gov/oes/special.requests/oes_research_2016_sec_99.xlsx.

PATENTS

Description: Patents granted per 1,000 private-sector workers, adjusted for industry mix.

Methodology: At both the national level and state level, patents per employee is calculated for 16 industry groupings (NAICS 311, 312, 313-316, 321, 322-323, 325, 326, 327, 331, 332, 333, 334, 335, 336, 337, 339).[94] Patents per employee for each industry at the state level is expressed as a ratio to patents per employee for each industry at the national level. Each ratio is multiplied by employment in its respective industry at the state level to obtain each state's expected employment adjusted for industrial mix. Expected employment and actual employment are summed across industries for each state. The summed expected employed is then divided by the summed actual employment and multiplied by the national value of patents granted per 1,000 private-sector workers for the final value.

Data Sources:

United States Patent and Trademark Office, Calendar Year Patent Statistics (fractional patent count tables, patent distribution by year of patent grant, patenting by NAICS industry classification, breakout by geographic origin (state and country), 2012; accessed May 3, 2017), https://www.uspto.gov/web/offices/ac/ido/oeip/taf/naics/naics_toc.htm.

Bureau of Labor Statistics, Quarterly Census of Employment and Wages (various series IDs, private sector; accessed May 3, 2017), http://www.bls.gov/cew/.

INDUSTRY INVESTMENT IN R&D

Description: The amount of research and development paid for by industry as a share of gross state product, adjusted for industry mix.

Methodology: At the national level, industry R&D investment per employee is calculated for 15 industry groupings (3254, 325 (excluding 3254), 333, 334, 335, 3364, 336 (excluding 3364), 31-33 (excluding 325, 333, 334, 335, and 336), 5112, 51 (excluding 5112), 52, 5415, 5417, 54 (excluding 5415, and 5417), and 21-23 plus 42-81 (excluding 51, 52, and 54)). Then R&D investment per employee for each industry is expressed as a ratio to R&D investment (aggregated across these 15 industry groupings) per employee. At the state level, each R&D ratio is multiplied by its respective employment to obtain each state's expected employment were its industrial mix the same as that on the national level. Actual employment in these industries is then divided by the expected employment to obtain the industrial mix adjustor. Total state industry R&D is then multiplied by the industrial mix adjustor to obtain adjusted state industry R&D. Adjusted state industry R&D is expressed as a share of total employee compensation for the final score.

Data Sources:

National Science Foundation, Business and Industrial R&D (table 2, funds spent for business R&D performed in the United States, by source of funds and selected industry, 2013; table 4, funds spent for business R&D performed in the United States, by source of funds and state, 2013; accessed April 28, 2017), https://www.nsf.gov/statistics/2016/nsf16313/#chp2.

Bureau of Economic Analysis, Regional Data (annual gross domestic product (GDP) by state, 2013; accessed April 28, 2017), http://www.bea.gov/regional/index.htm.

NON-INDUSTRY INVESTMENT IN R&D

Description: The amount of research and development performed outside of industry as a share of gross state product.

Methodology: Non-industry R&D performance (Total R&D performed minus Business R&D performed) expressed as a share of gross state product.

Data Sources:

National Science Foundation, Science and Engineering State Profiles (March 2017; accessed April 27, 2017),

https://www.nsf.gov/statistics/states/download/state-profiles-2017.xlsx.

Bureau of Economic Analysis, Regional Data (annual gross domestic product (GDP) by state, 2015; accessed April 28, 2017), http://www.bea.gov/regional/index.htm.

MOVEMENT TOWARD A CLEAN ENERGY ECONOMY

Description: A composite score of the change in energy consumption per capita, renewable energy as a share of total energy consumed, and change in renewable energy's share of total energy consumed.

Methodology: This composite variable is comprised of five indicators: change in residential energy consumption per capita, change in commercial energy consumption per capita, change in industrial energy consumption per capita, change in renewable energy consumed as a share of total energy consumed, and renewable energy consumed as a as a share of total energy. For the first four indicators, change is calculated with 2014 and 2011 as the reference years. For the first three indicators, the percentage change is multiplied by -1. The five indicators are each standardized then multiplied by the following weights: residential change 0.1, commercial change 0.1, industrial change 0.3, renewable change 0.2, renewable energy share 0.3. The five weighted values are summed for the final score.

Data sources:

Energy Information Administration, State Energy Data System (variable codes RETCB, TETCB, TECPB, TEIPB, TERPB, 2011, 2014; accessed May 2, 2017), https://www.eia.gov/state/seds/seds-data-fuel.php?sid=US#DataFiles.

VENTURE CAPITAL

Description: The amount of venture capital invested as a share of gross state product.

Methodology: Total venture capital investment for the most recent year (2016) is expressed as a share of gross state product.

Data sources:

PricewaterhouseCoopers, MoneyTree (regional aggregate data, 2016; accessed April 28, 2017), http://www.pwc.com/us/en/moneytree-report/assets/RegnlAggrData_Q1_2017_Final.xlsx

Bureau of Economic Analysis, Regional Data (annual gross domestic product (GDP) by state, 2015; accessed April 28, 2017), http://www.bea.gov/regional/index.htm.

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ABOUT THE AUTHORS

Robert D. Atkinson is the founder and president of the Information Technology and Innovation Foundation. He is also the co-author of the book *Innovation Economics: The Race for Global Advantage* (Yale, 2012). Atkinson received his Ph.D. in city and regional planning from the University of North Carolina at Chapel Hill in 1989.

J. John Wu is an economic analyst at ITIF. His research interests include green technologies, labor economics, and time use. He holds a B.A. in economics and sociology from The College of Wooster.

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1101 K Street NW • Suite 610 • Washington, DC 20005

mail@itif.org • Phone: (202) 449-1351 • Fax: (202) 638-4922 • Twitter: @ITIFdc