



# 2016 Oregon Innovation Index

## Why Innovation?

Innovation matters.

It matters to businesses because innovation gives them a competitive advantage - those that can recognize market opportunities and address them quickly and effectively are more likely to grow and succeed, especially in an ever-more global 21<sup>st</sup> Century economy.

It matters to governments because those cities and states that can attract and cultivate the innovative firms and top-notch talent able to innovate not just once, but over and over again, will be more successful in the new economy.

It matters to communities because innovation brings good jobs, better public infrastructure and the diverse social, commercial, and cultural resources that make life better.

It matters to Oregon's future.

## The Innovation Index

The *Oregon Innovation Index* was created to measure the state's innovation economy and identify opportunities for enhancing competitiveness. It is a key yardstick used by Business Oregon to track the state's success in building an innovation-based economy. An innovation-based economy is one that encourages new ideas, products and approaches to meet current or emerging demands of consumers. It directly impacts the ability of communities to grow and prosper.

Business Oregon and the Oregon Innovation Council (Oregon InC), a public-private partnership charged with creating an innovation-based economic strategy, identified key factors necessary for a healthy innovation economy, including: public-private partnerships for research and development, ready access to capital, statewide entrepreneurial networks, and targeted investments in emerging industries where Oregon has a global competitive advantage.

The first *Innovation Index*, published in 2004, evaluated nine indicators to track Oregon's progress. It was updated and expanded in 2007 to include 20 indicators to ensure that each stage of the innovation process, the expected outcomes, and the environment that leads to innovation were being measured. The *2009 Index* continued the framework established in 2007 with updated data for each of the indicators. The *2016 Index* also includes 20 indicators, but five of the indicators established in 2007 have been replaced with different indicators, primarily related to science, technology, engineering, and math (STEM) workforce and education.

The composite scores of the 2007 and 2009 indices were composed of a weighted sum of the 1-year, 5-year and national ranking performance for each indicator. The methodology for the *2016 Index* composite score has changed. Instead of looking at 1 and 5-year trends, the *2016 Index* looks at 10-year trends, in addition to national ranking and performance relative to the U.S. average. The



shorter term trends were removed because they were less valuable indicators of underlying trends. The composite score is still weighted, like before, with the 10-year trend weighted at 50 percent, national rank weighted at 33 percent, and performance relative to the U.S. average weighted at 17 percent. Due to the different indicators and methodology used in the *2016 Index*, the composite score from this index is not comparable to past scores from previous indices.

*The Index* uses the 10-year trend data to provide an introspective look at Oregon’s innovation economy. The index also looks at current performance compared to the U.S. for context on how well the state is doing in advancing innovation capacity.

## Oregon's 2016 Innovation Scorecard

Indicator	10-yr Trend	Relative to U.S. Average (latest yr)	Latest National Ranking
<b>Invention</b>			
Invention Disclosures	↑	↔	24
Patents	↑	↑	6
Patent Citations	↑	↔	12
<b>Translation</b>			
R&D Investments	↑	↑	10
SBIR/STTR Awards	↑	↑	11
University Licenses/Options	↑	↑	9
University Licensing Income	↑	↓	22
<b>Commercialization</b>			
Venture Capital Investments	↓	↓	18
Kauffman New Entrepreneurs	↓	↓	29
New Company Creation	↔	↑	17
University Startups	↔	↓	27
<b>Economic Prosperity</b>			
Manufacturing GDP	↑	↑	2
Average Wage	↑	↓	22
High Tech Employment	↓	↑	15
Exports	↑	↑	12
<b>Innovative Environment</b>			
Educational Attainment	↑	↔	17
STEM Workforce	↑	↑	15
STEM Graduates	↑	↔	31
Migration of Knowledge Workers	↑ <sup>1</sup>	↔	24
Broadband Access	N/A	↑	14
<b>2016 Innovation Score (out of 100)</b>			<b>67</b>

<sup>1</sup>Represents 9 year analysis from 2005 to 2014.  
Source: Business Oregon.



## The Innovation Score

Oregon's 2016 Innovation Score is 67. A score of 100 would mean Oregon was nationally ranked in the top ten for every indicator, had a positive 10-year trend for every indicator, and performed above the U.S. average for every indicator. Obviously, a score of 100 would be nearly impossible to attain for any state, given the number and variety of indicators used in the *Index*. As such, the score of 67 should not be evaluated as one would for academic grading (90-100 equals an A, 80-89 equals a B, etc.).

The state performed best in the categories of Translation, Invention, and Economic Prosperity. In patents, Oregon continues to outperform for its size, due in large part to an established, competitive high technology industry with strong research and development. Within Translation, Oregon has made strong gains in SBIR/STTR awards and university licenses and options. Oregon's overall Economic Prosperity has improved as well. Oregon's percentage of GDP from manufacturing is the second highest in the U.S. Wages have improved in Oregon, and the gap in average wage between Oregon and the U.S. has shrunk.

The state performed worst in the categories of Commercialization and Innovative Environment. Entrepreneurship has waned in Oregon over the past 10 years, but this issue is not limited to Oregon. Nationwide, rates of entrepreneurship are flat or down, depending on the measure used, as less Americans are starting businesses than before. While Oregon increased its educational attainment and STEM workforce over the past 10 years, Oregon ranks low in the number of STEM graduates from Oregon colleges and universities as a percentage of adults age 18-24.



# INVENTION

## Patents, Citations, & Invention Disclosures

### Key Message

New ideas are generated in Oregon at an increasing rate. In order to maximize value to the state, Oregon needs to focus on developing these ideas into new products and services for new and existing businesses.

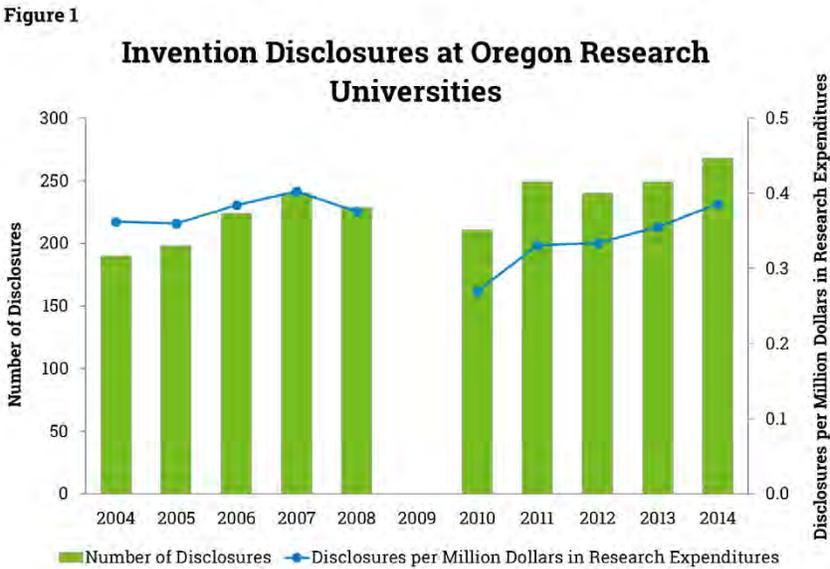
### Significance

The number of *invention disclosures*—the first step in determining if an invention should be patented—and *patents* measure the extent to which intellectual property is created in the state. *Patent citations*—when an inventor cites a previous patent in a patent application—are a measure of the technical relevance of a patent to later inventions. Commercially feasible research and development (R&D) reflects the innovative abilities of the various public and private research institutions to catalyze new products, jobs and companies.

### Performance

Oregon ranked 24<sup>th</sup> nationally in the number of invention disclosures coming out of the university system in 2014. The number of invention disclosures filed by the state’s research institutions has grown steadily since 2004, although disclosures per million dollars in research expenditures is essentially the same as it was 10 years ago after recovering from decreases brought on by the Great Recession (Figure 1).

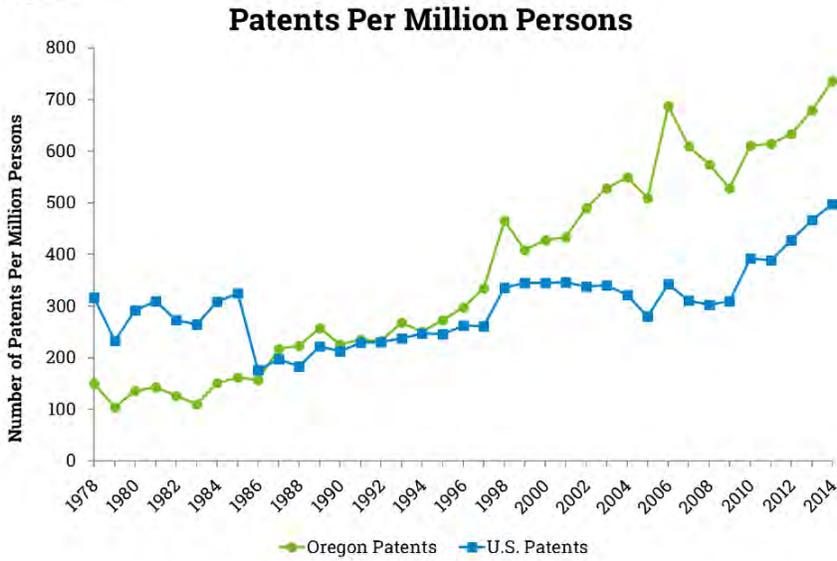
Oregon ranked 6<sup>th</sup> in the nation in patents per million persons and 12<sup>th</sup> in patent citations per million persons in 2014. The 10-year trends for both indicators are very positive. Oregon’s growth in patents per million persons over the past 10 years, though, has lagged the U.S. Still, Oregon’s rate remains much higher than the U.S. and is well above average (Figure 2). Growth in patent citations per million persons has generally kept pace with the U.S. and is nearly the same rate as the U.S., despite a relatively high rank of 12<sup>th</sup> amongst states (Figure 3).



Source: Association of University Technology Managers, Statistics Access for Tech Transfer.

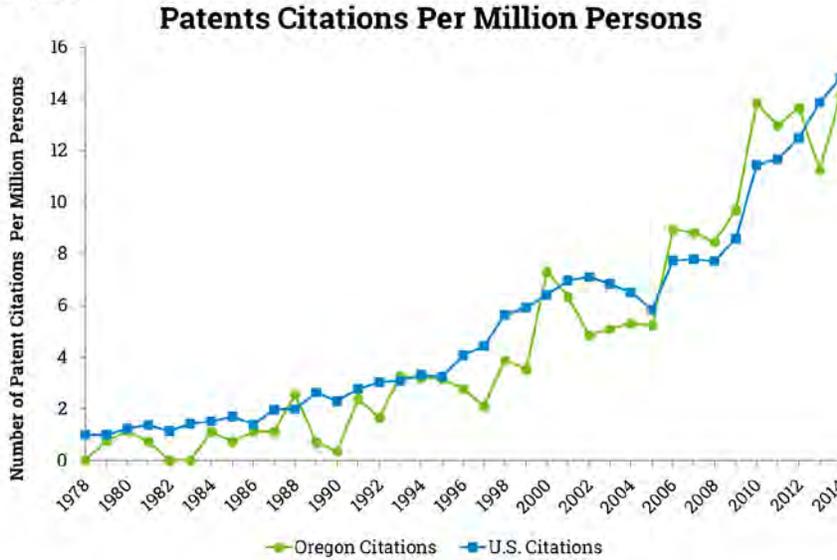


Figure 2



Sources: U.S. Patent and Trademark Office, U.S. Census Bureau, and Portland State University Population Research Center.

Figure 3



Sources: U.S. Patent and Trademark Office, U.S. Census Bureau, and Portland State University Population Research Center.



# TRANSLATION

## Research & Development

### Key Message

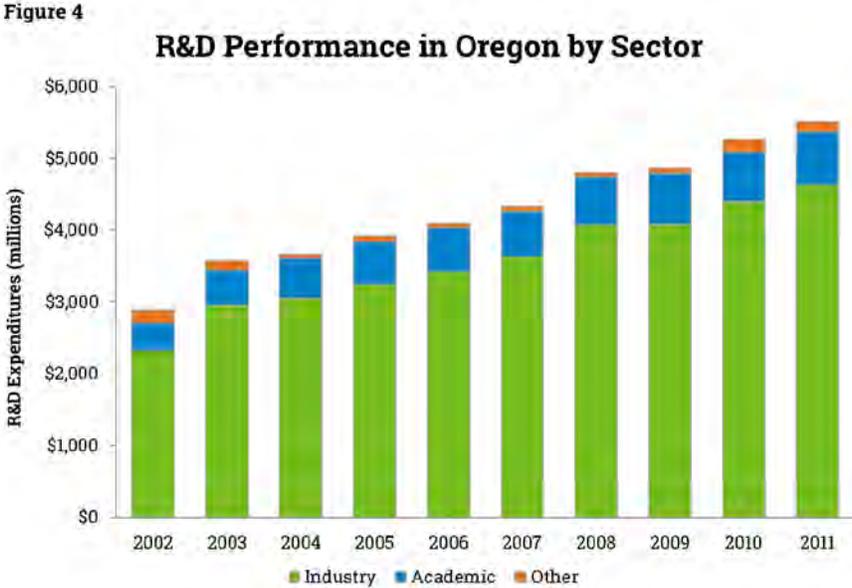
Oregon’s competency in forging research and development (R&D) partnerships among universities and private industry gives the state a competitive advantage. Because these R&D expenditures typically leverage federal and private support, bringing new dollars into the state, it is important for the state to continue to enhance this key source of innovation in our economy.

### Significance

R&D expands the knowledge base of industry and produces new products, which are key to sustained economic growth. New ideas, processes, and products fuel innovation and attract investment in Oregon companies.

### Performance

Oregon’s R&D spending is driven by private industry, which accounted for 84% of total R&D expenditures in 2011. Total R&D expenditures in Oregon increased 91 percent between 2002 and 2011 (2001 data on total expenditures not available) (Figure 4). Oregon ranked 10<sup>th</sup> nationally in industry R&D as a percentage of private sector Gross Domestic Product by state (GDP by state—the value of all goods and services produced in the state) in 2012 (Figure 5). Oregon’s industry R&D as a percentage of private sector GDP is higher than the U.S. average and increased 29 percent between 2002 and 2012 (Figure 6).



Source: National Science Foundation, *National Patterns of R&D Resources*



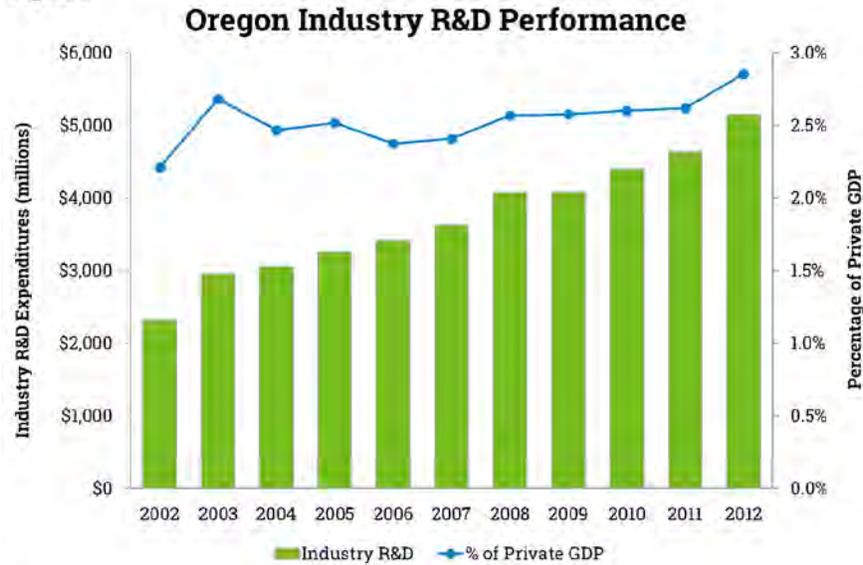
Figure 5

### Industry R&D Performance by State in Millions

State	2002				2012			
	Industry R&D	Private GDP	Percentage of Private GDP	Rank	Industry R&D	Private GDP	Percentage of Private GDP	Rank
U.S.	\$190,809	\$9,499,527	2.01		\$302,250	\$13,957,545	2.17	
Massachusetts	\$10,279	\$269,533	3.81	4	\$17,491	\$381,334	4.59	1
Delaware	\$1,219	\$38,561	3.16	7	\$2,415	\$53,187	4.54	2
California	\$39,664	\$1,260,216	3.15	8	\$81,689	\$1,851,805	4.41	3
Washington	\$8,579	\$213,686	4.01	2	\$14,494	\$333,323	4.35	4
Michigan	\$13,565	\$324,452	4.18	1	\$14,912	\$365,455	4.08	5
Connecticut	\$6,077	\$157,502	3.86	3	\$7,343	\$214,154	3.43	6
New Jersey	\$11,566	\$346,052	3.34	6	\$15,810	\$464,158	3.41	7
New Hampshire	\$1,153	\$41,932	2.75	10	\$1,857	\$58,300	3.19	8
Missouri	\$1,592	\$173,079	0.92	29	\$6,982	\$231,908	3.01	9
<b>Oregon</b>	<b>\$2,320</b>	<b>\$104,855</b>	<b>2.21</b>	<b>12</b>	<b>\$5,156</b>	<b>\$180,495</b>	<b>2.86</b>	<b>10</b>

Source: National Science Foundation, Business R&D and Innovation Survey, and U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts.

Figure 6



Source: National Science Foundation, National Business R&D Resources.



# TRANSLATION

## SBIR/STTR

### Key Message

The SBIR and STTR (Small Business Innovation Research/Small Business Technology Transfer) federal R&D grant programs drive innovation in small businesses. Oregon should continue to focus on increasing its share of these federal grants by enhancing the tools available to small business owners to successfully learn about and apply for SBIR/STTR funding.

### Significance

SBIR and STTR grants from federal agencies allow entrepreneurs to conduct research and develop new technologies. These programs often provide initial funding to help small companies turn ideas into commercially viable products.

### Performance

In 2014, Oregon received \$43.5 million in SBIR and STTR awards, an increase of 70 percent from 2004. Oregon SBIR and STTR awards accounted for 2.7 percent of total awards nationally in 2012, the latest year for which U.S. data is available (Figure 7). Since 2002, Oregon’s share of SBIR and STTR awards has more than doubled. Oregon received 63 SBIR awards and 7 STTR awards in 2014.

Oregon ranked 11<sup>th</sup> among all states in SBIR and STTR awards per \$1 million of GDP in 2014. Oregon’s performance in this measure has improved since 2004, when Oregon was ranked 17<sup>th</sup> in the nation. Oregon had the fifth largest increase in SBIR and STTR award dollars per million in GDP amongst all states from 2004 to 2014 (Figure 8).

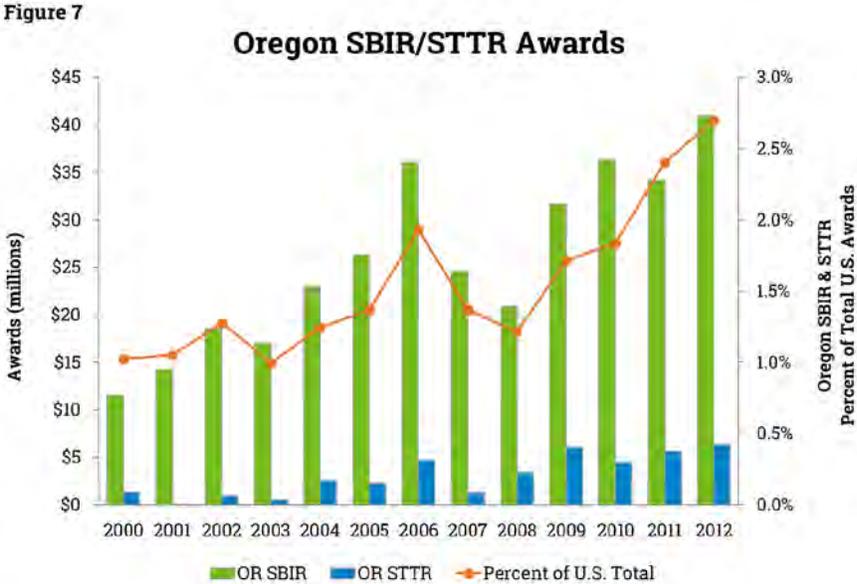
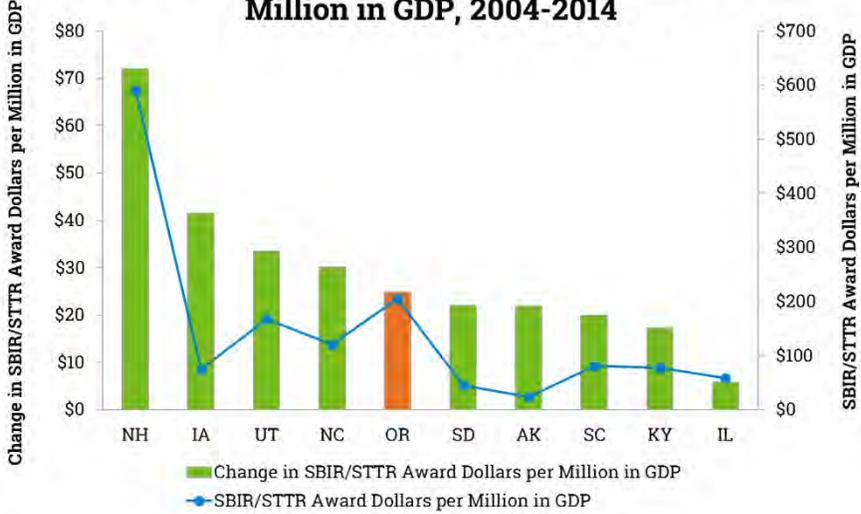




Figure 8

### Change in SBIR/STTR Award Dollars per Million in GDP, 2004-2014



Source: Small Business Administration and U.S. Department of Commerce, Bureau of Economic Analysis.



# TRANSLATION

## University Licensing Income & Options

### Key Message

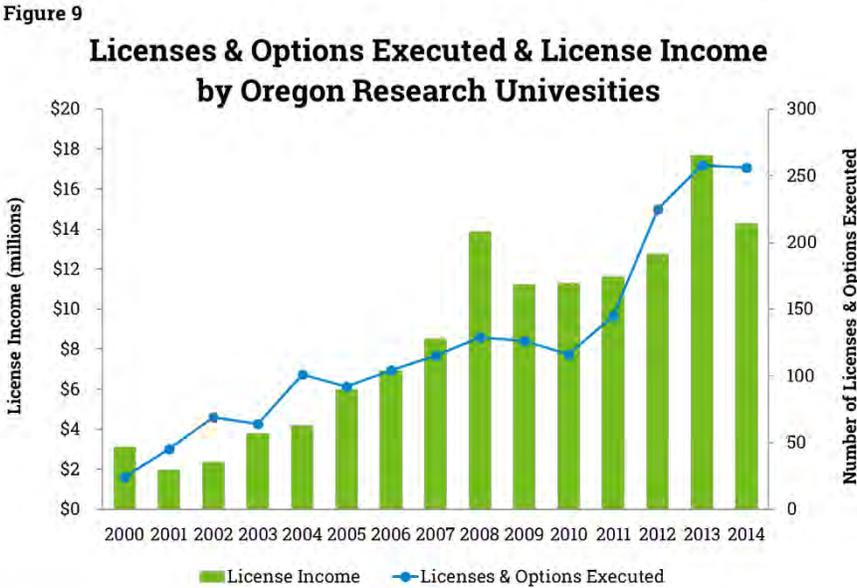
Oregon universities have had increasing success in generating income from the licensing of new technologies to businesses. Continued focus on this measure will increase linkages between higher education and private businesses that will help commercialize new technologies.

### Significance

*University licensing income*—the amount firms pay universities to use their technology—and *options*—the agreement firms make with universities to use their technology—are indications of the commercial viability of university inventions. The number of licenses and options executed in a given year tells how many university inventions appear to have commercial potential. The amount of income universities receive is an indication of the value companies assign to the intellectual property developed at research institutions.

### Performance

Oregon ranked 9<sup>th</sup> in the nation in the number of licensing options executed and 22<sup>nd</sup> in the nation in licensing income in 2014. Oregon ranked below the U.S. average in licensing income per \$1 million in research expenditures. University licensing income in Oregon has more than tripled since 2004 (Figure 9). This increase indicates that Oregon research universities are generating more income from private sector use of their intellectual property. Likewise, the number of licenses and options executed at Oregon universities in 2014 was two-and-a-half times larger than 2004. This indicates that companies are increasingly integrating university research into their products and services.



Source: Association of University Technology Managers, Statistics Access for Tech Transfer



# COMMERCIALIZATION

## Venture Capital

### Key Message

Attracting venture capital into the state is vital for innovative Oregon businesses to thrive. Venture capital investments in Oregon have grown in recent years. Continuing this trend will be vital to growing Oregon’s innovation economy.

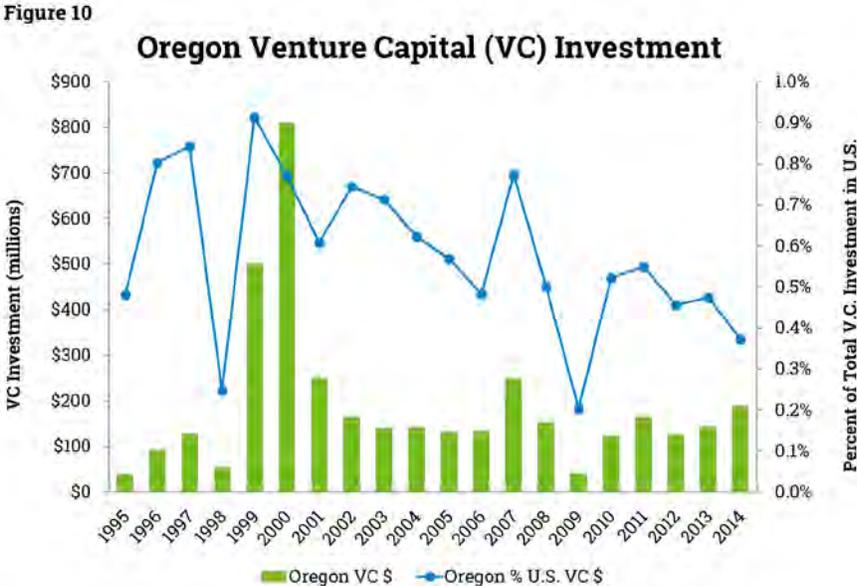
### Significance

Access to capital plays a crucial role in new firm formation and stimulating economic growth. Venture funds and angel investors provide the risk capital many companies need to begin or expand their operations.

### Performance

Oregon venture capital investment in 2014 was at its highest level since 2007, and 33 percent higher than 2004. While Oregon venture capital investment today is a far cry from the levels of investment seen in the run up prior to the dot-com bubble bursting, investment trends in recent years are positive. Comparatively, though, Oregon’s share of venture capital investment in the U.S. has steadily declined, from 0.62 percent in 2004 to 0.37 percent in 2014 (Figure 10).

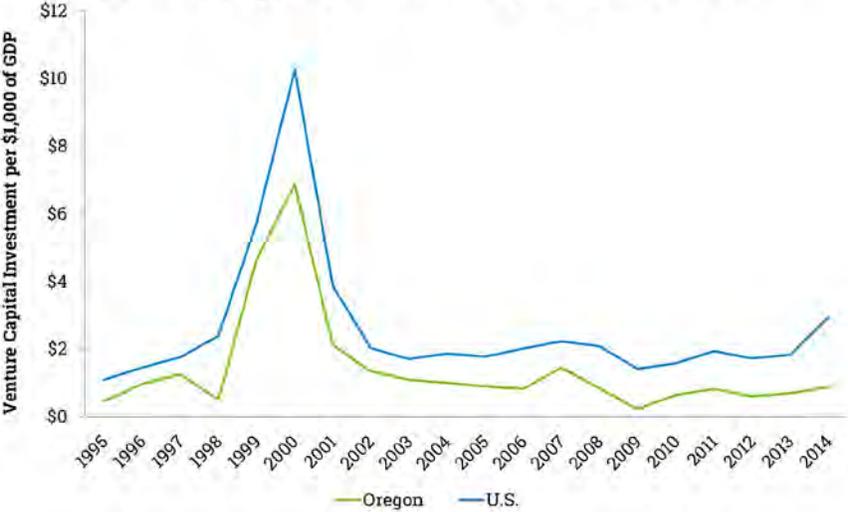
Oregon ranked 18<sup>th</sup> in the nation in venture capital investment per \$1,000 of GDP in 2014. Despite ranking in the second quintile, Oregon’s venture capital investment per \$1,000 of GDP is below the U.S. average (Figure 11). This is mainly due to a handful of states—primarily California and Massachusetts—that receive large amounts of venture capital investment, driving the U.S. average well above the median for states.



Source: PricewaterhouseCoopers/National Venture Capital Association MoneyTree® Report based on data from Thomson Reuters



**Figure 11**  
**Venture Capital Investment per \$1,000 of GDP**



Source: PricewaterhouseCoopers/National Venture Capital Association MoneyTree™ (report based on data from Thomson Reuters)



# COMMERCIALIZATION

## Entrepreneurial Activity

### Key Message

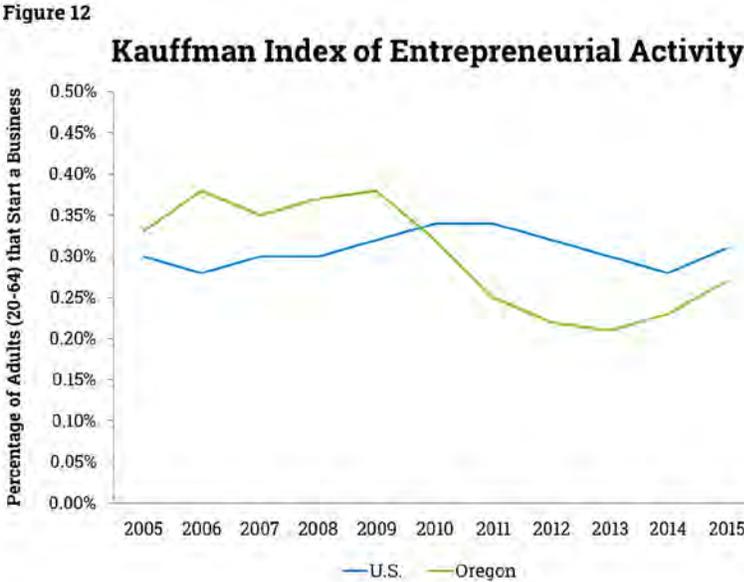
States that are able to generate and support entrepreneurship will be well-positioned to develop new products and services. Startup firms have the potential to grow rapidly and provide leadership in developing new markets that benefit both emerging and existing businesses around the state.

### Significance

*Entrepreneurship*—the creation of new companies—is often used as a measure of the extent to which new ideas are introduced into the market. These new ideas are one measure of innovation in an economy. The Kauffman Foundation’s Index of Entrepreneurial Activity calculates the percentage of individuals ages 20 to 64 who start a new business.

### Performance

In 2015, Oregon ranked 29<sup>th</sup> in the nation in entrepreneurial activity. This is down from a ranking of 18<sup>th</sup> in 2005. Oregon’s entrepreneurship rate also declined from 0.33 percent in the *2005 Index* to 0.27 percent in 2015. The U.S. rate has remained relatively unchanged, but other measures of entrepreneurship, such as establishment births from the Bureau of Labor Statistics’ Business Employment Dynamics, show a decline in entrepreneurship nationwide. Nonetheless, Oregon’s rank in this measure has slipped compared to other states, and is now below the U.S. average (Figure 12).



Source: Evening Blawie/Kauffman Foundation, Kauffman Index of Entrepreneurship Series.



# COMMERCIALIZATION

## New Business Creation

### Key Message

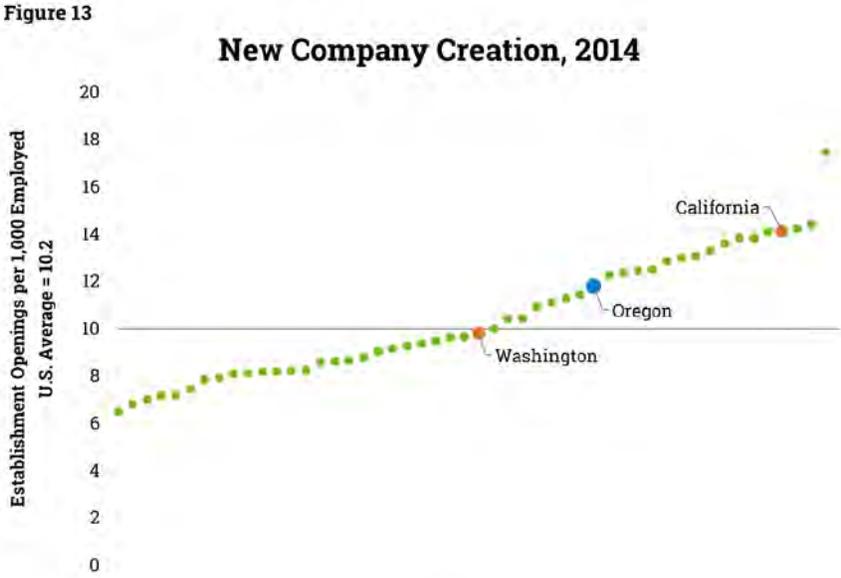
Startup firms have the potential to grow rapidly and provide leadership in developing new markets that benefit both emerging and established industries around the state. The nationwide decline in the rate of new business creation highlights the need to encourage entrepreneurship and foster new business creation.

### Significance

New businesses create new jobs, which expand and strengthen economies. They introduce new, innovative practices to the marketplace that lead to new and improved products or services. A high rate of new business creation is an indication of an innovative, dynamic, and entrepreneurial economy.

### Performance

The rate of new business creation nationwide is at its lowest point in 20 years. States are doing well to maintain their new business creation rates, let alone grow them. In 2014, Oregon ranked 17<sup>th</sup> in the nation in the number of new establishments per 1,000 employed in the state and exceeded the U.S. average (Figure 13). Oregon's rate of new business creation in 2014, 11.8, was unchanged from its rate in 2004. The U.S. rate declined from 10.4 to 10.2.



Source: U.S. Bureau of Labor Statistics, Business Employment Dynamics



# COMMERCIALIZATION

## University Startups

### Key Message

University startups are a good indication that commercialization of university research is paying off. Streamlining the process which transfers university research to new business ventures will increase Oregon’s ability to attract new investment and encourage collaborative partnerships between researchers and entrepreneurs.

### Significance

*University startups*—companies formed from university research—measure the number of new businesses that are created as a direct result of university intellectual property. This measure demonstrates the strength of Oregon’s university system in commercializing research and fostering entrepreneurship.

### Performance

Oregon ranked 27<sup>th</sup> nationally in university startups in 2014. Oregon has not made significant gains in the number of university startups over the past 10 years (Figure 14) and is below the U.S. average. The number of university startups from year-to-year tends to be volatile. To reduce this pipeline volatility, the state should continue to focus on commercializing research and utilizing research funding for market-ready products and services at Oregon universities.



Source: Association of University Technology Managers, Statistics Access for Tech Transfer



# ECONOMIC PROSPERITY

## Manufacturing GDP

### Key Message

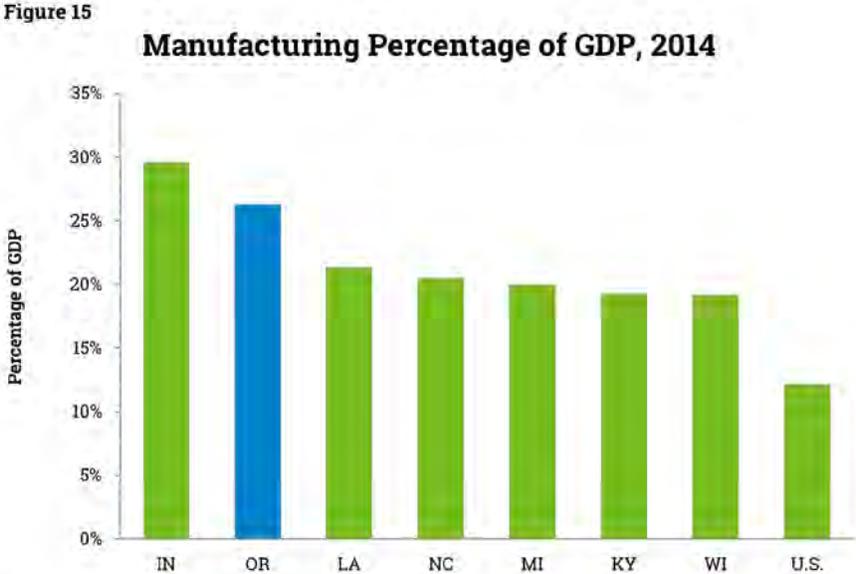
Oregon’s high value-added manufacturing is a vital source of innovation in the state and gives Oregon a distinct competitive advantage. Manufacturing drives industry R&D in Oregon, the U.S. and throughout the world. It is important for the state to maintain and grow this key source of innovation in our economy.

### Significance

Manufacturing accounts for about 70 percent of all industry R&D worldwide and in the U.S. Manufacturing R&D leads to the development of new, innovative products that generate additional demand, enabling manufacturers to compete and succeed in the global economy. Manufacturing GDP demonstrates Oregon’s strength in innovation and the skill and productivity of its workers.

### Performance

Oregon derives more of its GDP from manufacturing than any other state, but one (Figure 15). Oregon’s manufacturing percentage of GDP is over twice as high as the U.S. average. In terms of GDP, manufacturing is by far the largest industry in Oregon, accounting for over a quarter of total GDP in the state. The 10-year trend is positive as well, meaning manufacturing is becoming more and more important to Oregon’s economy.



Source: U.S. Bureau of Economic Analysis, Regional Economic Accounts



# ECONOMIC PROSPERITY

## Average Wage

### Key Message

Oregon must continue to focus on growing the wages of workers statewide. One of the key drivers of wage growth is human capital development. A skilled and educated workforce creates value for Oregon companies, thereby contributing to average wage growth.

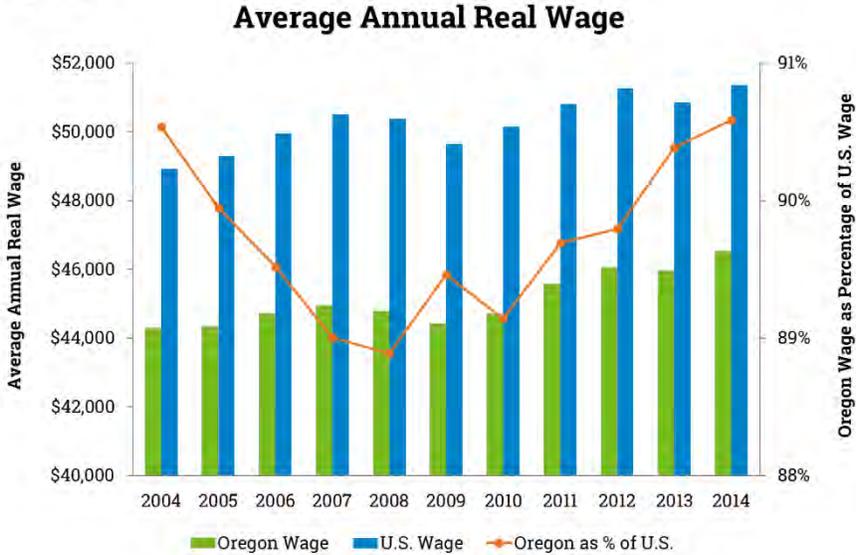
### Significance

Average wage measures trends in the average annual pay of workers in Oregon. This measure is limited to workers covered by unemployment insurance, which excludes self-employed workers. Wages have been adjusted for inflation.

### Performance

The real average annual wage in Oregon has grown over the past 10 years. While the average wage dropped in Oregon during the Great Recession, as it did in most states, wage growth rebounded strongly over the past six years. Oregon's wage growth since the recession has been stronger than average as evidenced by Oregon's shrinking wage gap with the U.S. average annual wage (Figure 16). Despite recent growth, though, Oregon's average annual wage as a percentage of the U.S. average wage in 2014 was essentially the same as 2004.

Figure 16



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment & Wages and National Compensation Survey - Employment Cost Trends



# ECONOMIC PROSPERITY

## High Technology Employment

### Key Message

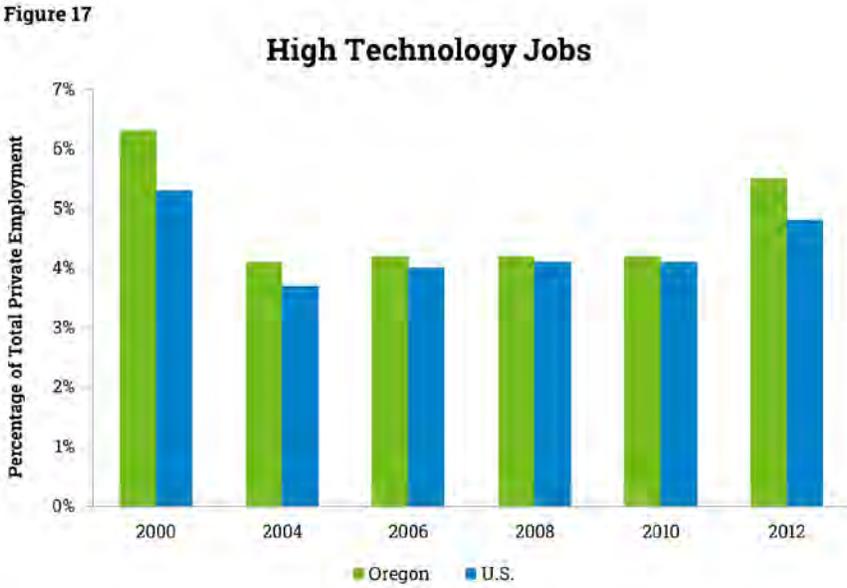
Oregon has a well-established high technology industry group, which commercializes new ideas and generates high-wage jobs. More and more, companies, both large and small, are dependent on technological innovation to compete in the global economy. Thus, it is important to maintain the state’s competitive advantage in high technology industries.

### Significance

Technology sector industries—as defined by the *2014 State New Economy Index*—are an important part of an economy because they are key engines of innovation and a source of high-paying jobs. States with a critical mass of jobs in technology-generating industries tend to attract other businesses and workers with a high degree of inventiveness, and help to increase the competitiveness of all traded sector industries.

### Performance

Oregon ranked 15<sup>th</sup> nationally in percentage of high technology jobs in 2012. Oregon’s high technology industry group includes over 75,000 manufacturing and service jobs that accounted for 5.5 percent of Oregon’s private sector employment (Figure 17). High tech jobs are at their highest percentage of private employment in Oregon since 2000, when high tech jobs accounted for 6.3 percent of jobs, amounting to employment of nearly 86,000. Unlike the 1990s, though, when job growth in Oregon high tech was fueled by computer and electronic products, recent job growth in high tech is being led by high tech services, such as internet publishing, computer systems design, data centers, and software publishing.



Source: The Information Technology & Innovation Foundation, *2014 State New Economy Index*



# ECONOMIC PROSPERITY

## Exports

### Key Message

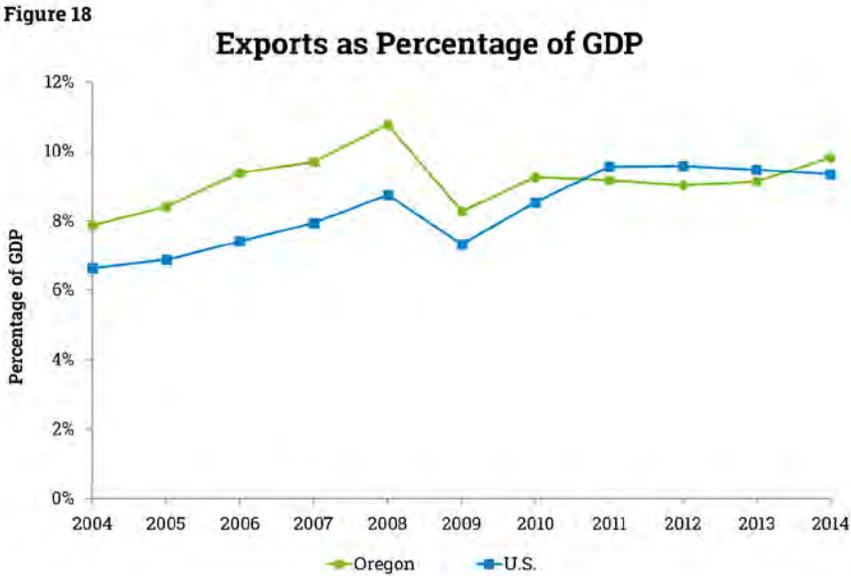
Oregon’s relatively high ranking in exports and proximity to China and other emerging markets demonstrates the state’s competitive advantage in developing global markets and providing customers worldwide with high quality, innovative products and services.

### Significance

Export-oriented companies have a multiplier effect on the local economy. As these companies work to meet the demand for their products, they rely on local firms to supply goods and services, which benefit the state’s economy. Exports create additional demand for traded sector goods and services, which in turn create jobs, spur innovation, and increase wages in Oregon.

### Performance

In 2014, Oregon exported \$20.9 billion worth of goods to 198 countries and territories around the world. Oregon ranked 12<sup>th</sup> in the nation in exports as a share of GDP by state. From 2004 to 2010, Oregon’s exports as a share of GDP were considerably higher than the U.S. average, but since then Oregon has maintained a share similar to that of the U.S. (Figure 18). 2014 was the first time in four years that Oregon surpassed the U.S. average in this measure.



Sources: U.S. Bureau of Economic Analysis, National & Regional Economic Accounts; and <http://wissertrava.us.gov> data from U.S. Census Bureau, Foreign Trade Division



# INNOVATIVE ENVIRONMENT

## Educational Attainment

### Key Message

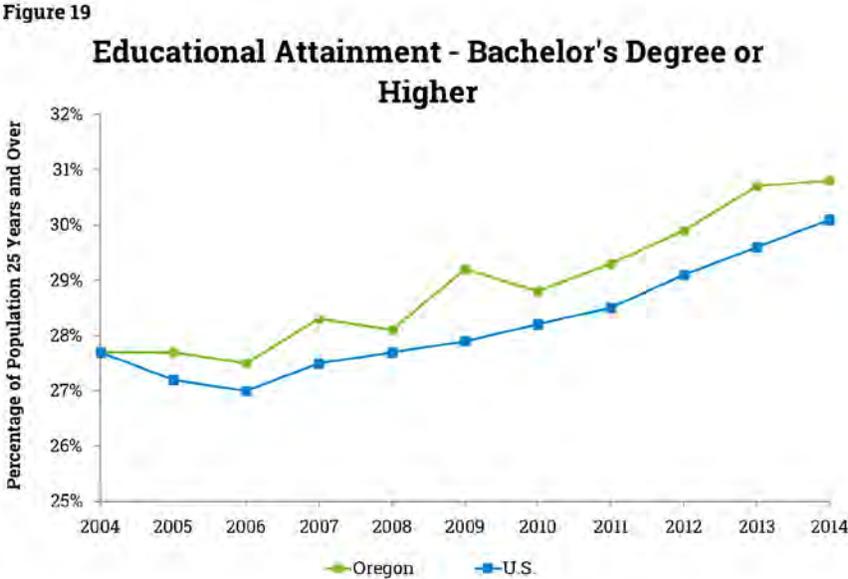
Educational attainment is an important indicator of the human capital that is available in Oregon. The role of education in creating a successful innovation environment cannot be overstated. Investments in Oregon’s educational system—kindergarten through graduate school—and continued in-migration of highly educated workers benefit the state in the form of a highly skilled workforce.

### Significance

Educational attainment is a key driver of the innovation economy. Innovation cannot occur if educated people are not plentiful in Oregon companies, universities, and other innovation incubators.

### Performance

Educational attainment is rising in Oregon. In 2014, Oregon ranked 17<sup>th</sup> in the nation in percentage of adults with a Bachelor’s degree or higher. Over the past 10 years, Oregon has improved steadily in this measure (Figure 18). In 2004, Oregon had the same percentage of adults with a Bachelor’s degree or higher as the U.S. Oregon’s rate is now higher than the U.S. average.



Source: U.S. Census Bureau, American Community Survey, 1 Year Estimates



# INNOVATIVE ENVIRONMENT

## STEM Workforce

### Key Message

Growing Oregon’s science, technology, engineering, and mathematics (STEM) workforce is vital to the state’s economic competitiveness and growth. STEM workers are the professionals spearheading research and development of innovative products and services and are increasingly in demand by Oregon’s innovative companies.

### Significance

STEM workers are at the center of an innovation economy. Oregon’s research and development capacity and competitiveness is directly connected to STEM. Growing the STEM workforce, both through in-migration of knowledge workers and increasing the number of STEM graduates from Oregon universities, is key to attracting and growing innovative businesses.

### Performance

Oregon STEM employment ranked 15<sup>th</sup> in the U.S. in 2014 as a percentage of total employment. More importantly, Oregon’s STEM employment is rising. Oregon had the tenth-largest increase in STEM employment between 2004 and 2014 amongst all states (Figure 20). At 6.3 percent, STEM employment in Oregon was also above the U.S. average of 6.1 percent.

Figure 20

### STEM Employment

State	2004				2014				2004-2014		
	STEM Employment	Total Employment	STEM % of Employment	Rank	STEM Employment	Total Employment	STEM % of Employment	Rank	2004-2014 CHANGE	CHANGE RANK	Total STEM Employment Change
Michigan	228,820	4,324,840	5.3%	14	284,120	4,073,730	7.0%	7	1.7%	1	55,300
Delaware	21,230	413,940	5.1%	18	28,390	424,330	6.7%	9	1.6%	2	7,160
Washington	190,240	2,614,640	7.3%	5	254,960	2,898,350	8.8%	3	1.5%	3	64,720
Arizona	124,660	2,370,810	5.3%	15	168,060	2,526,990	6.7%	10	1.4%	4	43,400
New Mexico	34,870	754,990	4.6%	29	46,660	788,000	5.9%	18	1.3%	5	11,790
Maryland	193,590	2,477,280	7.8%	3	230,760	2,557,510	9.0%	1	1.2%	6	37,170
California	931,100	14,598,250	6.4%	7	1,135,710	15,119,730	7.5%	6	1.1%	7	204,610
Ohio	245,590	5,324,700	4.6%	30	296,630	5,200,880	5.7%	20	1.1%	8	51,040
Alaska	15,470	295,810	5.2%	16	20,170	324,970	6.2%	17	1.0%	9	4,700
<b>Oregon</b>	<b>84,740</b>	<b>1,576,890</b>	<b>5.4%</b>	<b>13</b>	<b>106,600</b>	<b>1,683,470</b>	<b>6.3%</b>	<b>15</b>	<b>1.0%</b>	<b>10</b>	<b>21,860</b>

Source: U.S. Bureau of Labor Statistics, Occupational Employment Statistics and SOC Policy Committee.



# INNOVATIVE ENVIRONMENT

## STEM Graduates

### Key Message

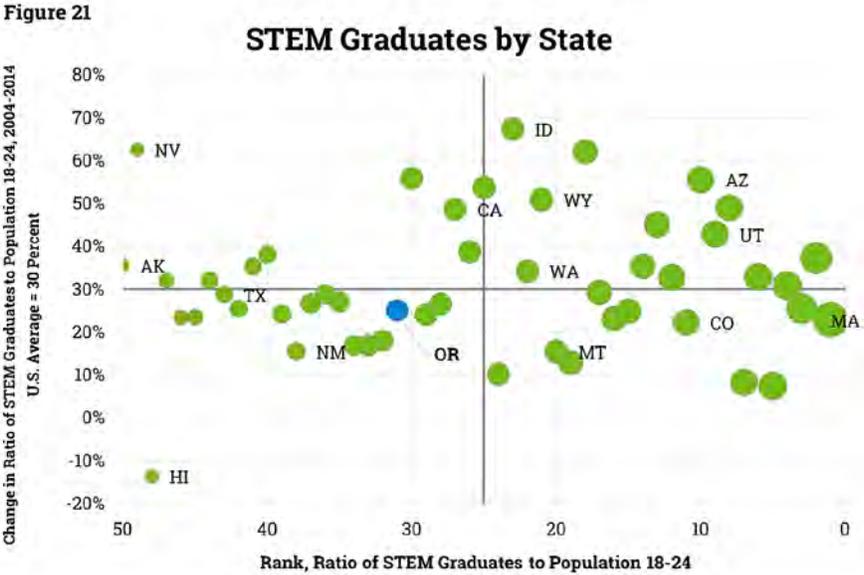
States with high numbers of STEM graduates are amongst the most innovative economies in the U.S. States recognize this and the number of STEM graduates nationwide are rising. States that increase the number of their STEM graduates will likely grow their innovation economies faster than states that do not.

### Significance

The innovation economy needs a high quality STEM workforce to succeed and grow. States can grow their STEM workforce through in-migration or by creating STEM graduates at state universities. States with high numbers of STEM graduates, though, tend to have more innovative economies than states with low numbers of STEM graduates. The innovation ecosystem created by large numbers of STEM graduates offers a significant competitive advantage for those states.

### Performance

Oregon is not amongst the leaders in the U.S. in STEM graduates (Figure 21). Oregon ranked 31<sup>st</sup> in STEM graduates as a percentage of the population age 18 to 24 in 2014. Oregon's ratio of 18.14 was also lower than the U.S. average of 18.65. While Oregon has increased its STEM graduates from 2004, it is not keeping pace with growth in STEM graduates in other states. Between 2004 and 2014, Oregon's STEM graduates rate increased 25 percent, but that was not enough to prevent Oregon from falling from 24<sup>th</sup> in the U.S. in 2004 to 31<sup>st</sup> in 2014.



Sources: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System and U.S. Bureau of Labor Statistics, SOC Policy Committee



# INNOVATIVE ENVIRONMENT

## Migration of Knowledge Workers

### Key Message

States and their businesses compete for talent. States that are the most successful in attracting U.S. knowledge workers increase their educational attainment, which leads to higher incomes and lower unemployment.

### Significance

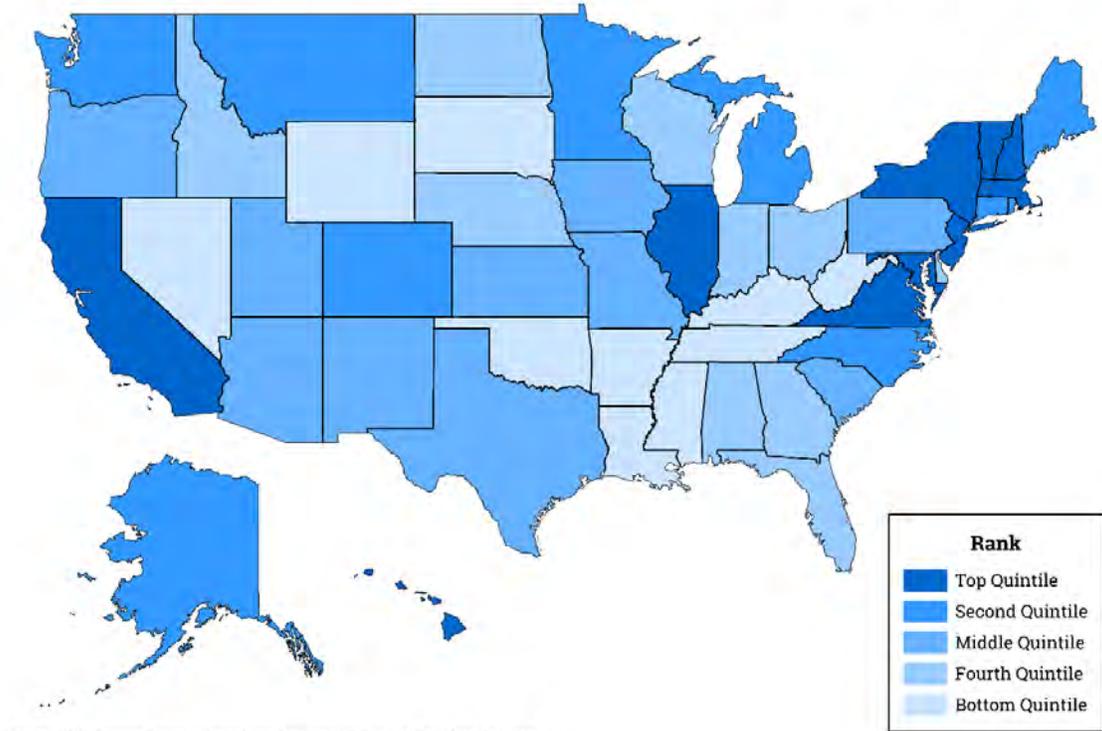
Educational attainment is a major factor in determining a population's income and unemployment. Highly educated people are more likely to have higher incomes and lower unemployment than those who are less educated. Knowledge workers are attracted to states that offer high-paying jobs and a high quality of life. They are also more involved in the innovation economy, as many innovation jobs require a Bachelor's degree or higher.

### Performance

Oregon ranked 24<sup>th</sup> in the nation for migration of U.S. knowledge workers in 2014 (Figure 22). This ranking is based on the educational attainment of U.S. in-migrants to states from all other states. Oregon has been successful attracting knowledge workers to the state since 2004, as the educational attainment of in-migrants has increased. The educational attainment of Oregon in-migrants is about the same as the U.S. average.

Figure 22

### Migration of Knowledge Workers in U.S., 2014



Source: U.S. Census Bureau, American Community Survey One Year Estimates.



# INNOVATIVE ENVIRONMENT

## Broadband Access

### Key Message

Oregon’s ability to develop and maintain broadband internet access is vital in a business environment that emphasizes global markets and internet-dominated communication. States that are able to increase the speed and reliability of internet connections will be leaders in the innovation economy.

### Significance

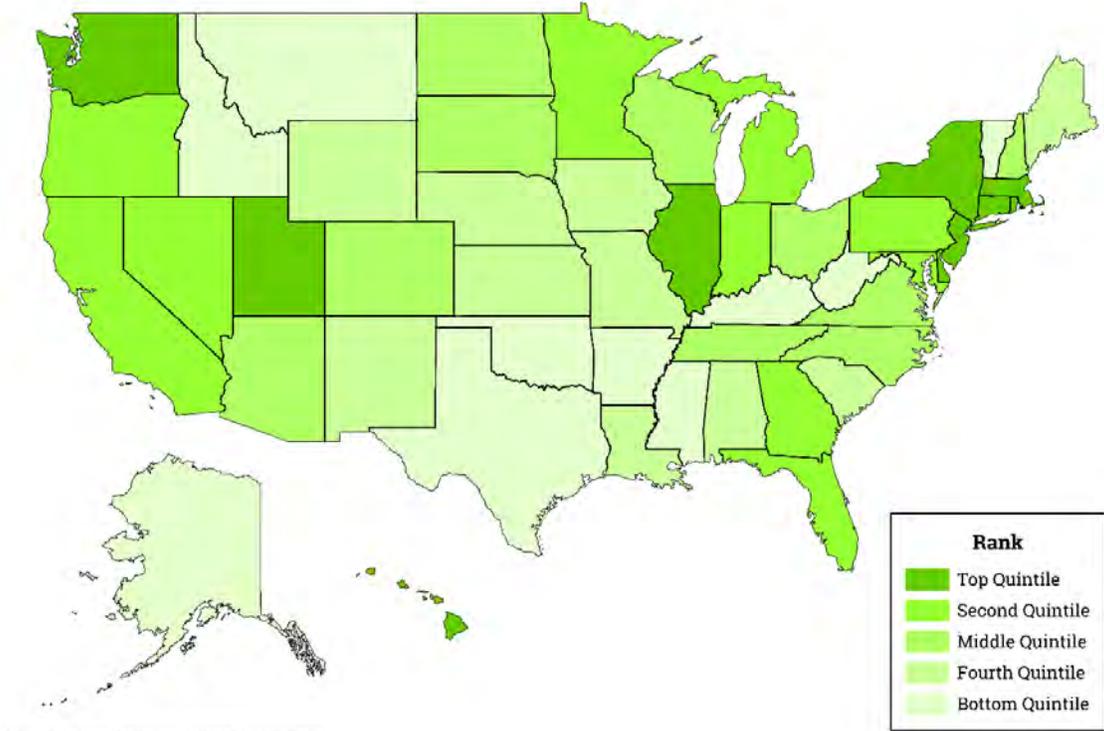
Broadband—defined as 25 megabits (Mbps) for downloads and 3 Mbps for uploads—access allows for faster transmission of data, which is critical for businesses that rely on the internet to communicate with customers, suppliers, and colleagues. Broadband access facilitates knowledge dissemination and collaboration by reducing the costs associated with telecommunications and business transactions.

### Performance

Oregon ranked 14<sup>th</sup> in the U.S. in broadband access in 2013. 93 percent of Oregon’s population has access to broadband internet connections. Oregon’s broadband access rate is much higher than the U.S. average of 83 percent, and about equal to California’s rate, but lower than Washington’s (Figure 23).

Figure 23

### Broadband Access, 2013



Source: Federal Communications Commission.



**Acknowledgements**

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