DALLAS-FORT WORTH
REGIONAL INNOVATION ASSESSMENT
2018

DALLAS REGIONAL CHAMBER®

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INDEX

ABOUT US

The Dallas Regional Chamber (DRC) supports the principles of Innovation Economics, a view in which innovation lies at the heart of increasing productivity. We do this by building strategic networks and advocating for conditions that encourage entrepreneurship as the primary approach for addressing socio-economic challenges and exploring new opportunities. Our goal is to amplify the power of homegrown ingenuity—the heartbeat of innovation—to prime a highly productive and inclusive regional economy for generations of Dallas-Fort Worth (DFW) residents to come.

The DRC, the United Way of Metropolitan Dallas and Southern Methodist University have partnered with Accenture to prepare a roadmap that will guide us in fostering a regional Innovation Economy. The resulting Innovation Study is due for public release in the summer of 2018. In anticipation of the Study's findings, we have created this Innovation Assessment as a baseline to evaluate the success of future actions.

The Assessment benchmarks DFW's performance in relation to the largest and/or most competitive domestic metropolitan areas on key metrics that indicate regional innovation potential. These metrics are grouped into broad categories of factors that influence a metro's ability to innovate, including: the growth and attraction of highly skilled talent; the flow of funding into research and other innovation-producing activities; the quality of education and support for new ideas; and the general business climate and living standards. The Assessment also includes an Innovation Scorecard—index rankings from respected sources that evaluate various aspects of innovation potential. For more about innovation-related happenings in the DFW Region, please visit DallasInnovates.com.

01 Attractiveness

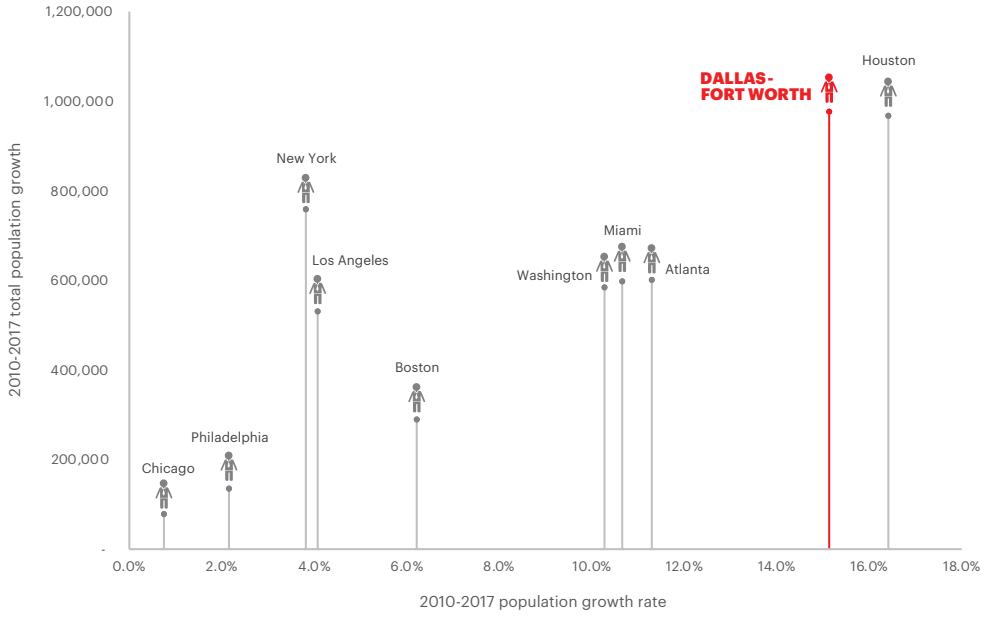
PEOPLE POWER

A number of factors influence a region's potential for innovation. One important consideration is population. Whether the region is growing enough to meet the demands of an expanding economy can be a powerful determinant of success. It's not just about numbers, though. More people won't necessarily translate to greater innovation. A region needs to be able to attract and grow the talent that can support an Innovation Economy, which frequently refers to professionals in the fields of technology and science, as well as those with an entrepreneurial spirit. This section highlights population growth as a first look at regional innovation potential.

THE GROWTH FACTOR

DFW ranks fourth in population among the top 10 largest US metros, but it's growing rapidly in both total increase and rate of change. Over 2010–2017, DFW added nearly a million new residents, more than any other area in the country. In fact, it added nearly 400 people per day in 2017. With a growth rate of 15.1 percent since 2010, DFW ranks second only to Houston. DFW's dramatic expansion over the previous decade suggests the region possesses a strong appeal for families to grow and for people seeking to relocate for new opportunities.

Population growth in the 10 largest US metros

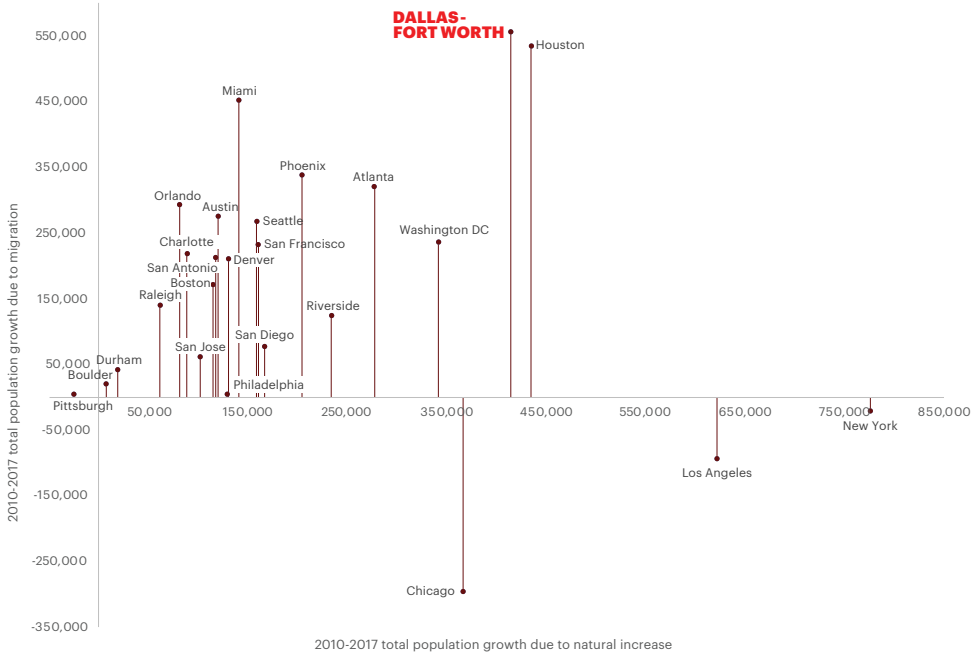


Source: Population Estimates, US Census Bureau, 2010–2017.
See Appendix Table 1 for full data set.

NATIVES AND NEWCOMERS

A region's ability to grow its population through a balance of natural increase—births minus deaths—and net migration can be a source of economic strength and stability. Net migration accounts for 60 percent of DFW's population growth since 2010. The balance is the result of natural increase, a healthy split among components of population change. Since 2010, over half a million people moved to DFW, more than in any other US metro. Two-thirds of those moves represent domestic relocations, also more than in any other US metro. In contrast, many coastal and older US metros are experiencing significant domestic out-migration. This places a heavier burden on natural increase or international migration to maintain growth.

Components of population change in comparison metros

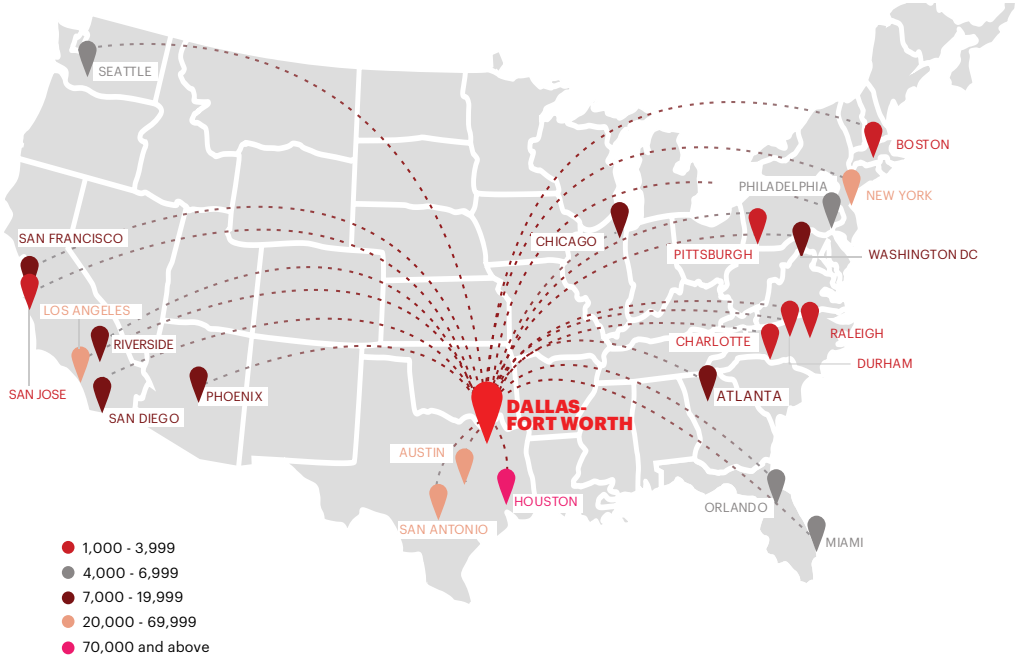


Source: Population Estimates, US Census Bureau, 2010–2017.
See Appendix Table 2 for full data set.

FROM THERE TO HERE

Domestic in-migration patterns reflect the perceived attractiveness of a region. This perception can be influenced by family ties, work opportunities, lifestyle choices or a lower cost of living. For all of these reasons, DFW has become a magnet for people relocating from top US metros competing for talent. Between 2011–2015, DFW welcomed more Houstonians than any other transplants, as the two biggest Texas metros share a close cultural bond. However, DFW also welcomed tens of thousands of people from New York, Los Angeles, Chicago, and throughout the US looking to relocate for new opportunities.

In-migration to DFW from comparison metros

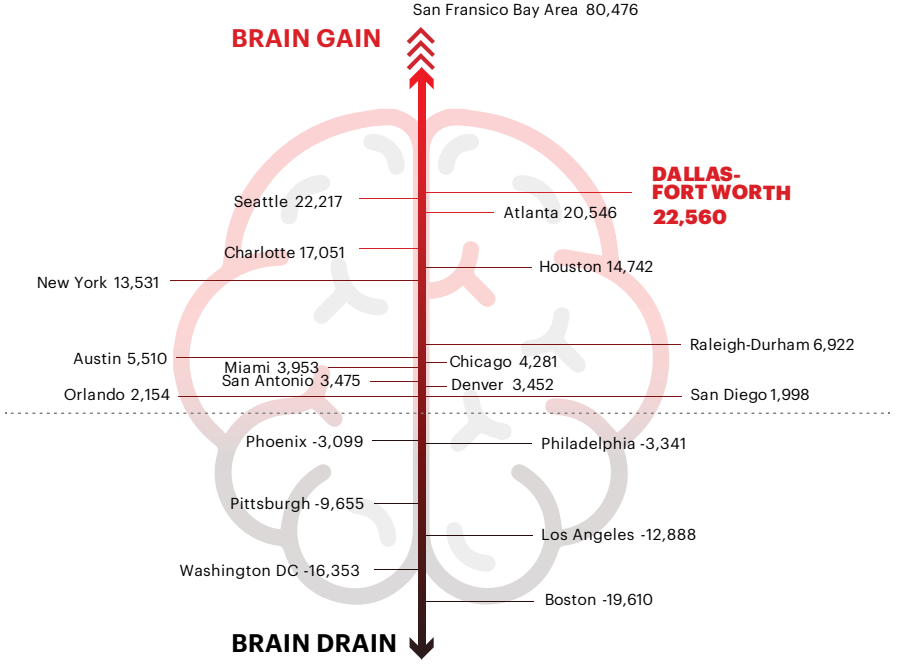


Source: PUMS, US Census Bureau (cross-tabulated by Dr. Tim Bray, UTD), 2011–2015.

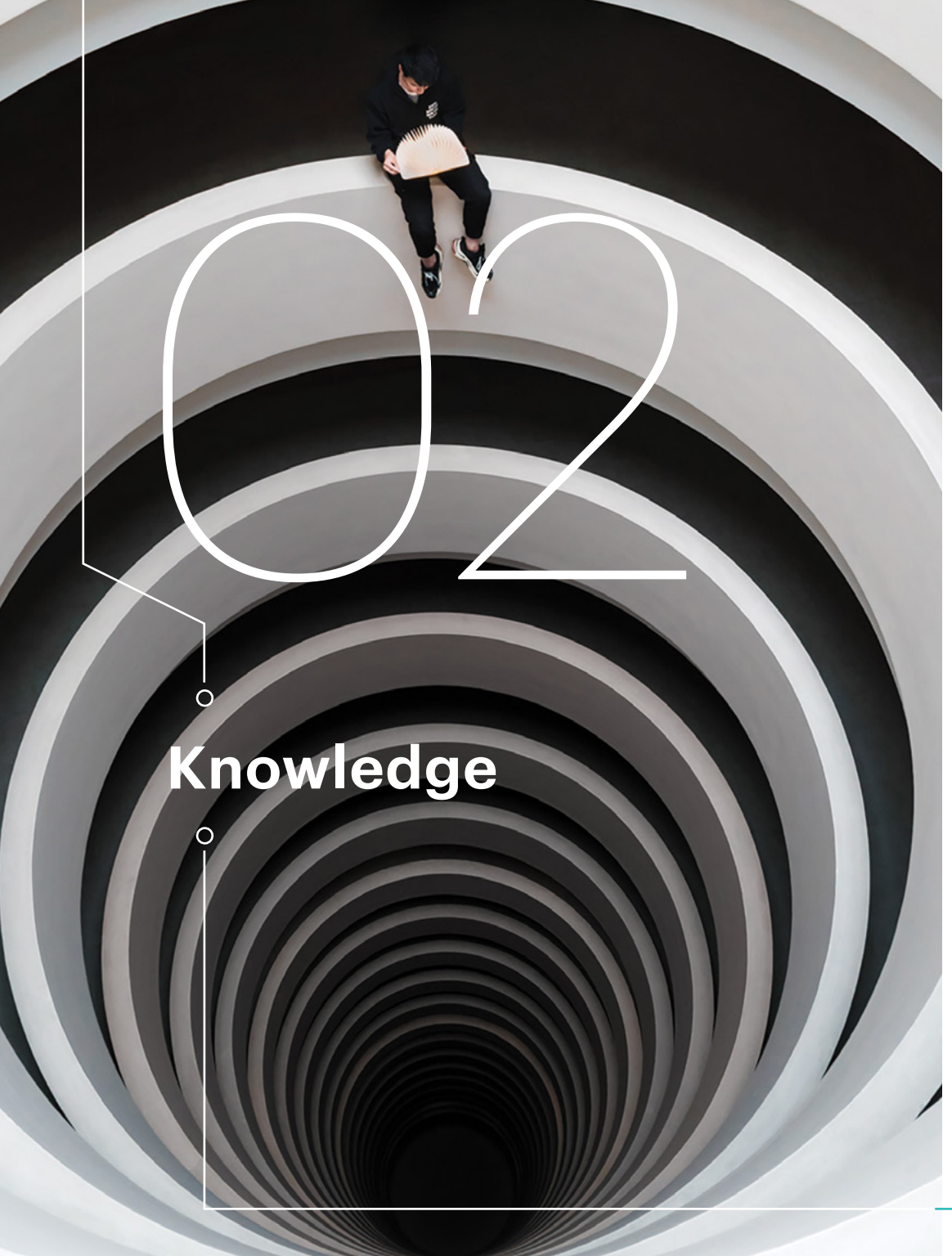
BRAIN GAIN VS DRAIN

Brain gain or drain refers to a metro's divergence between how many people are trained locally in a particular field and how many jobs are created that require such expertise. Between 2011 and 2015, DFW produced nearly 18,000 new tech degree graduates, but it created more than 40,000 new tech jobs. To fill the demand, the metro gained 22,560 new "brains" from outside the region. DFW was second only to the Bay Area in its ability to attract tech talent for occupations considered necessary to feed an Innovation Economy. On the other end of the scale, Boston, for example, suffers from brain drain. While the metro produces an enormous number of tech degree graduates, the economy cannot absorb them all as supply outpaces demand.

Gain or loss of talent trained in tech fields in comparison metros



Source: Scoring Tech Talent, CBRE, 2012– 2016.
See Appendix Table 3 for full data set.



02

Knowledge

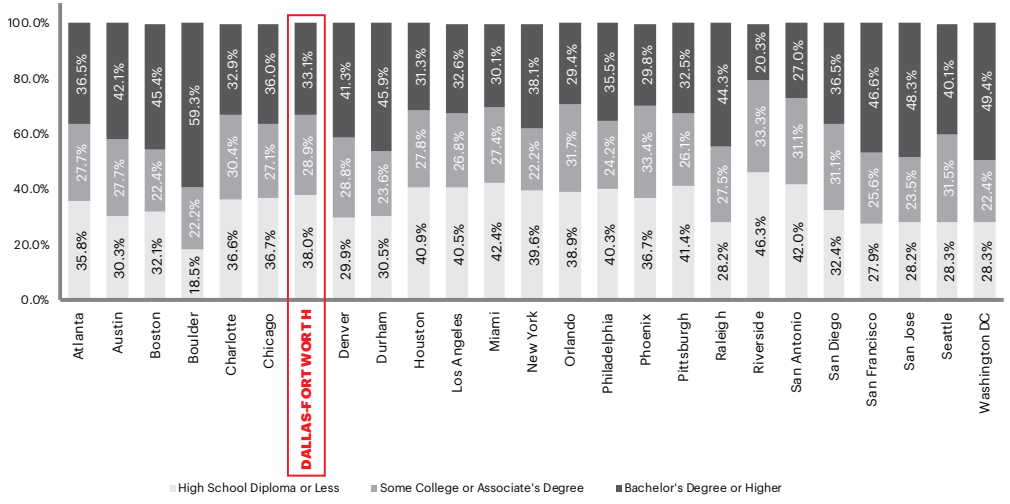
LEARNING TO ADAPT

Innovation is powered by the quest for knowledge and the capacity to apply that knowledge in new and useful ways. Closely associated with knowledge is the attainment of a formal education. The impact on lifetime earnings of obtaining advanced levels of education has been well documented. However, the current rate of technological change, coupled with the demands of an Innovation Economy, will require future workers to continuously improve their knowledge and to apply it adaptively to changing conditions. This section explores the current state of educational attainment and the quality of educational opportunities by metro area.

TO A DEGREE

Investment in education not only contributes to the earning potential of the individual, but also to the overall economic growth of a region. According to the Organization for Economic Co-operation and Development, 43 percent of adult Americans have a post-secondary education, but the distribution of degreed talent is disproportionately weighted toward metros. Even among metros, the concentration of highly educated talent can vary. Small university metros like Boulder, where 59 percent of the population has a bachelor's degree or higher, contrast with sprawling metros like Riverside, where only 20 percent possess a bachelor's or advanced degree.

Educational attainment by comparison metro

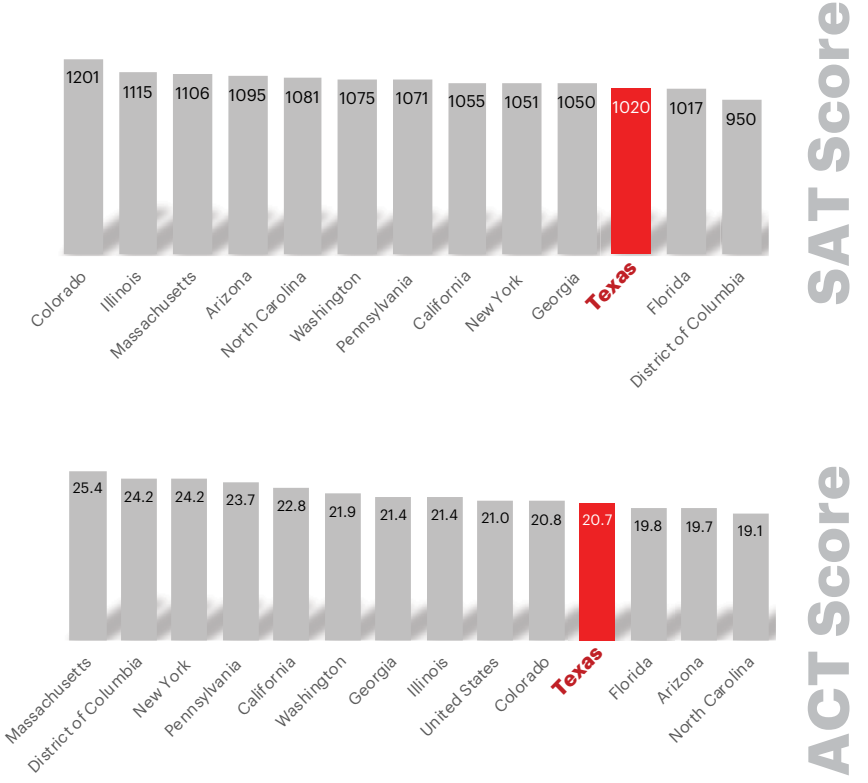


Source: American Community Survey 5-Year Estimates, US Census Bureau, 2012– 2016.
Note: Percent of population ages 25 and above.

PREPARED TO ADVANCE

Standardized tests attempt to measure college readiness and predict academic success. Although public debate over the effectiveness of such tests continues, most colleges use standardized test scores to assist in the admissions decision process. While the two predominant tests—the SAT and the ACT—measure different aspects of a student's aptitude, performance in the aggregate can be a powerful indicator of how well a state education system prepares its high school students for higher learning.

Average SAT and ACT scores by comparison metros' home state



Source: The College Board and ACT Inc., 2017.

QUALITY OF INSTRUCTION

Every year, US News & World Report compiles data on universities throughout the country to determine which are the best performing. The top 100 universities rate highly in one or more of the following categories: first-year student retention rates, assessment by administrators at peer institutions, faculty resources, admissions selectivity, financial resources and alumni giving, and graduation rate performance. The greater the concentration of top-rated universities within a region, the greater the opportunity for retaining and attracting the brightest minds and possibly future innovators.

Number of top 100 nationally ranked universities by comparison metro

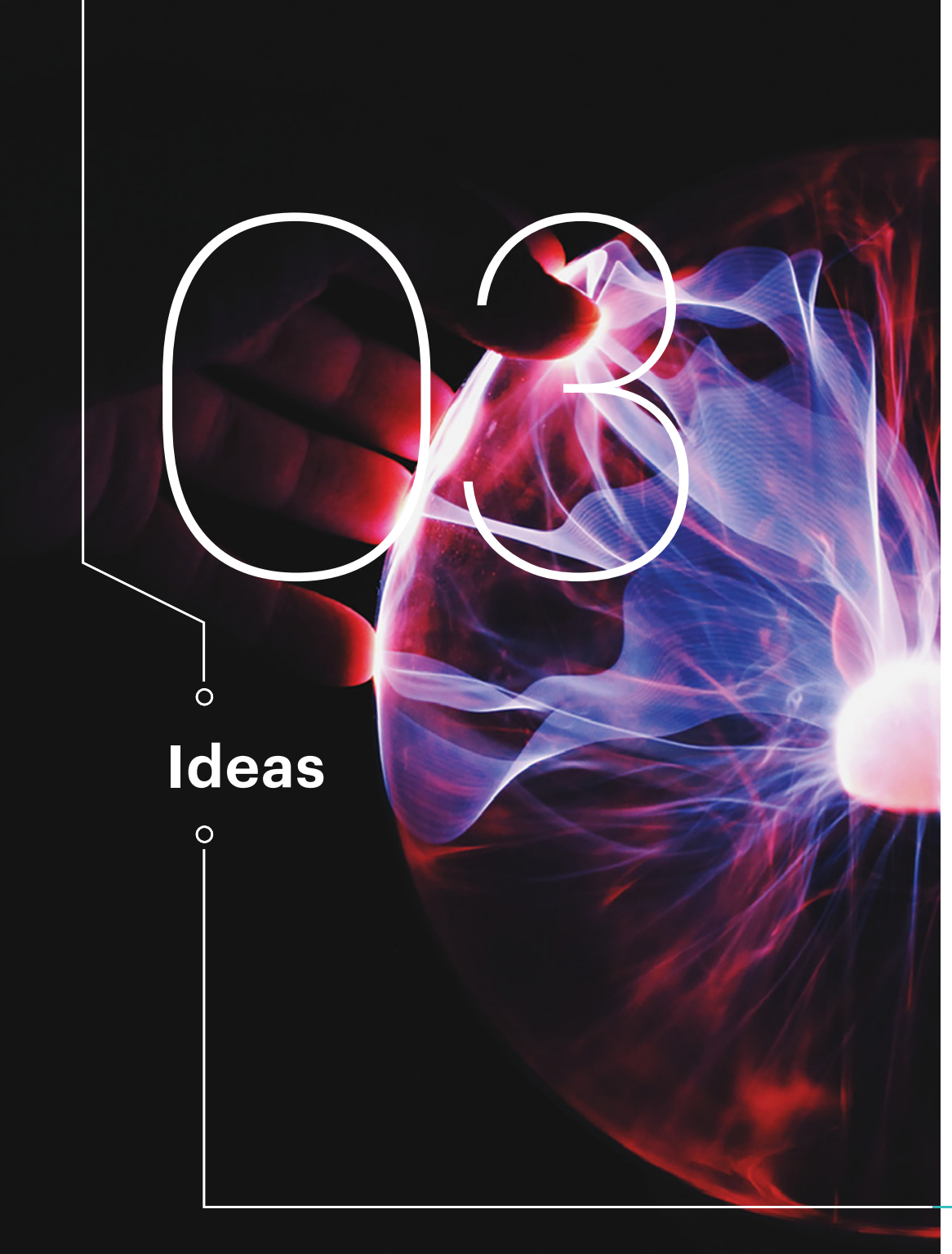
Source: US News & World Report, 2018.

STEM HITS THE MAINSTREAM

In a global economy increasingly defined by technological innovations, the skills demanded by the labor market are changing. This new reality has thrust the sciences and related disciplines into the mainstream. A 2015 study published in Science Magazine found that recipients of doctorates in all science fields disproportionately gained placements in large, high-wage private businesses. Those who remain in academia typically engage in research that pushes the boundaries of human knowledge and holds commercialization potential. The concentration of Ph.D. recipients in science, technology, engineering and mathematics —or STEM disciplines—can have an enormous impact on regional innovation potential.

Number of science and engineering doctorates by comparison metro

Source: EMSI, 2016.



03

Ideas

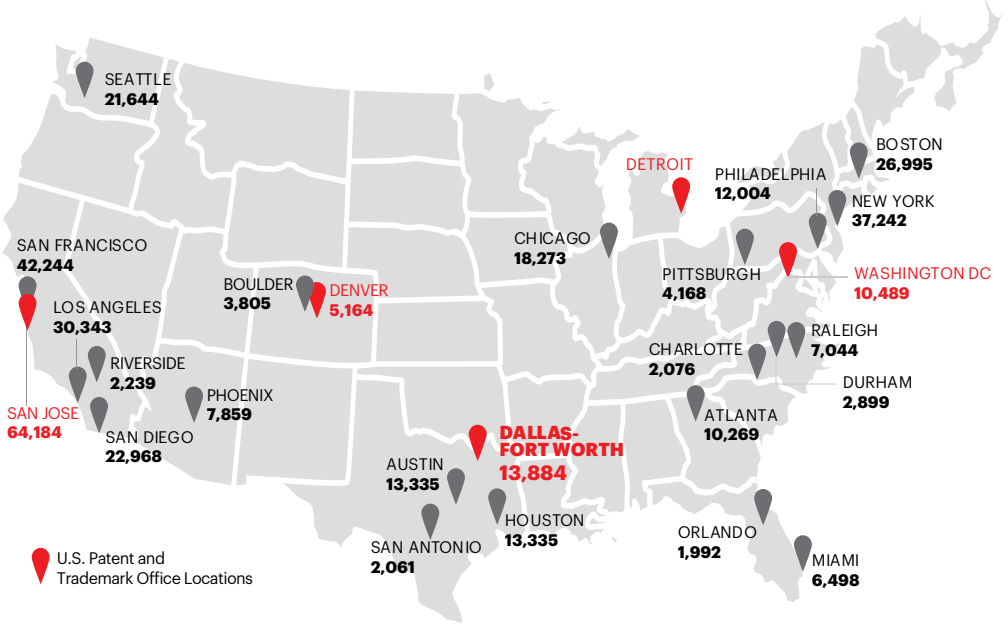
THE NEXT BIG BREAKTHROUGH

Curiosity lies at the heart of innovation. Regions that encourage individual and institutional curiosity also tend to exhibit openmindedness because they look favorably on the act of questioning why conditions exist and what, if anything, to do about them. Mixing curiosity with a healthy dose of ingenuity and persistence can lead to a breakthrough idea, a precursor to innovation. To protect the intellectual property that might arise from the ideation phase of innovation, independent inventors and institutional researchers, alike, can apply for patents. This section explores the role of patents and patent-producing research institutions in regional innovation.

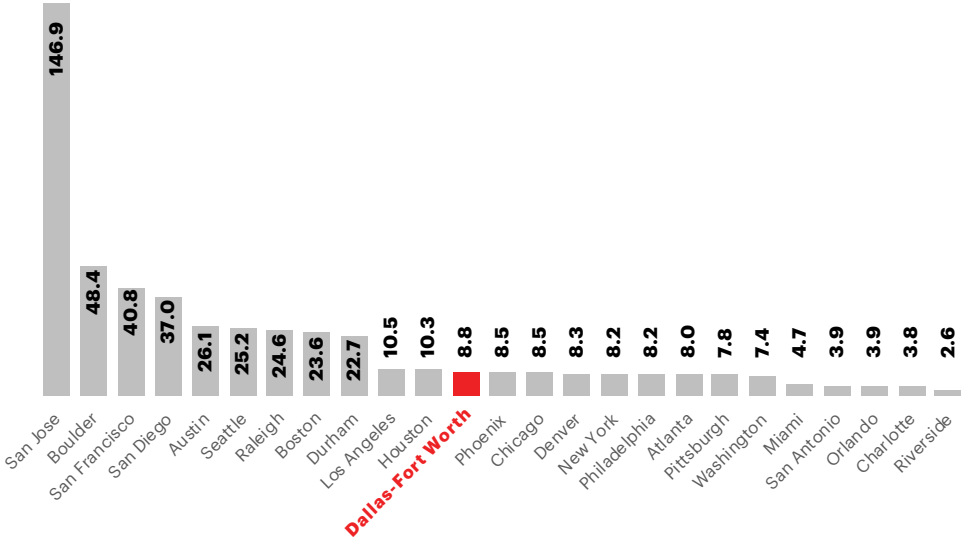
THE PATENT SAFEGUARD

The US Patent and Trademark Office protects the intellectual property of innovative researchers and inventors. Four satellite offices, including one located in DFW, join the central office in Washington, DC, to assist with the patent process. The number of patents originating in a region helps to quantify the level of innovation output occurring there, and is dependent on several factors, including the strength of the local inventor community; how many corporate, medical and/or educational R&D facilities are located in the area; and the region's dependence on technology-based industries. As shown below, the total volume of patents generated within metros in 2015 varied widely, but it can be normalized against the number of employees in the region. Furthermore, each region may specialize in specific classes of patents based on the strength of home industries. For instance, the top 10 patent classes for DFW appear on the opposite page.

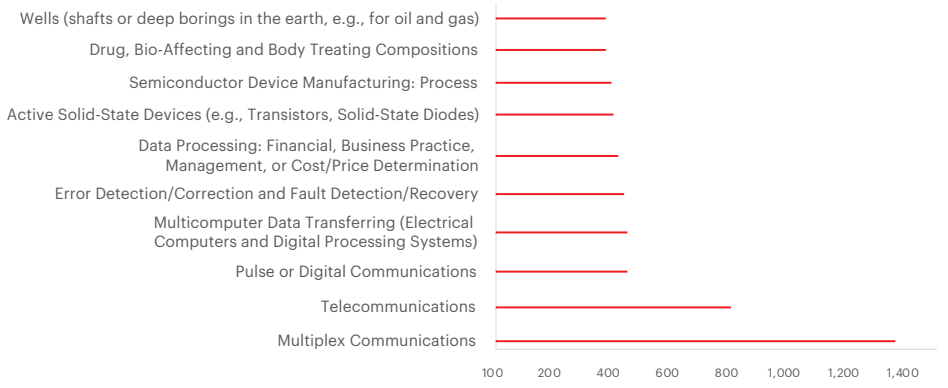
Total number of patents issued by comparison metro



Patents issued per 10,000 employees by comparison metro



Top 10 patent classes in DFW by volume



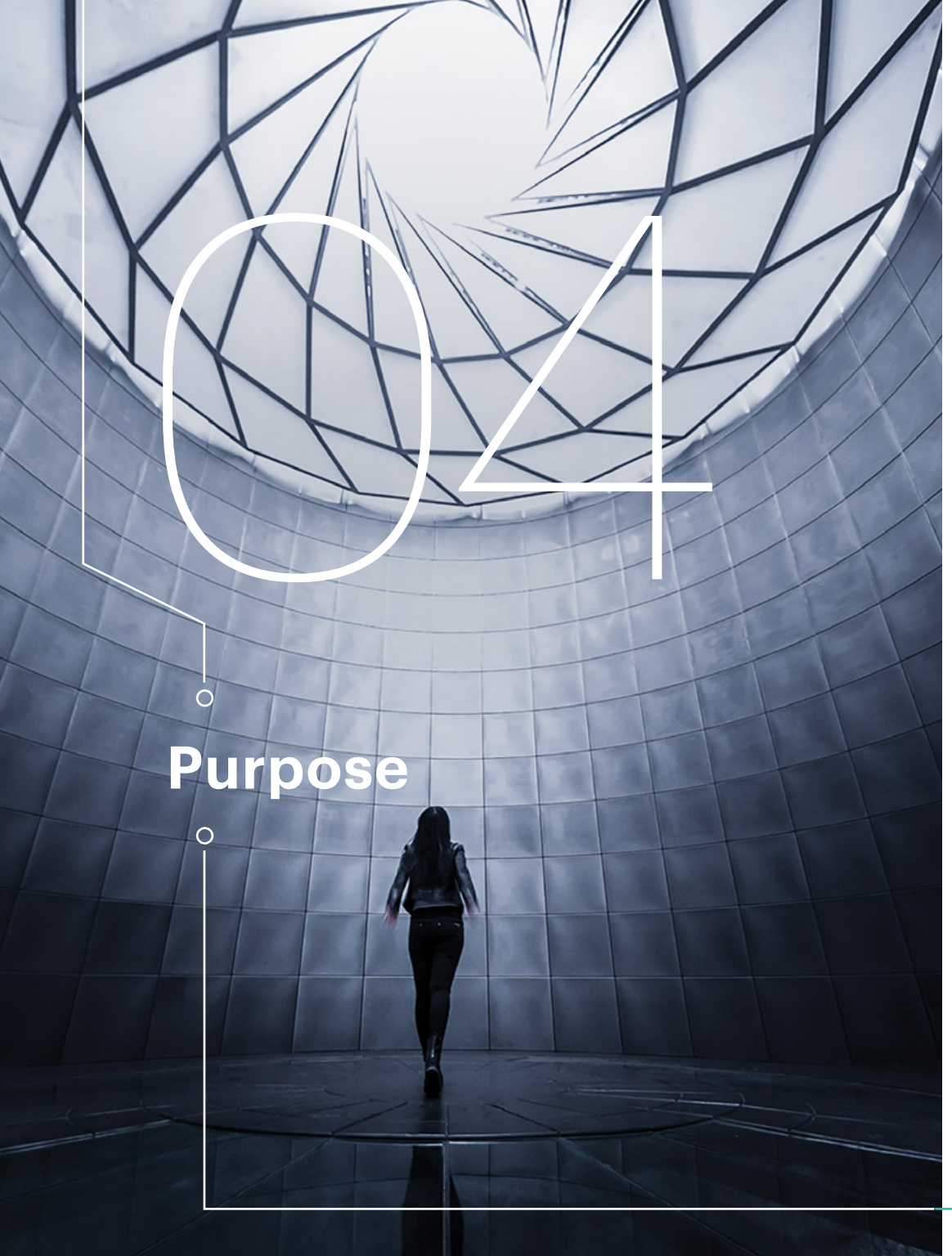
Source: US Patent and Trademark Office, 2015; LAUS, Bureau of Labor Statistics, 2015.

TOP-TIER RESEARCH

In a modern, ideas-based Innovation Economy, applied knowledge drives future growth. A common feature of metros regarded as hubs of innovation is the presence of at least one, but often a cluster of top-tier research universities. Not only do these institutions attract the brightest minds, they also attract research funding used to develop original solutions to some of today's most complex problems. The Carnegie Classification of Institutions of Higher Learning recognizes the need to evaluate research institutions on their quality and level of research activity, the top tier being R1: Highest Research Activity. Boston is the premier research center in the US, with seven R1 universities, followed by New York and Washington, DC, with five each. DFW is home to three top-tier institutions—the University of North Texas, the University of Texas at Arlington, and the University of Texas at Dallas.

Top ranked research institutions in comparison metros

Note: No Carnegie R1: Doctoral university designations for Charlotte, Denver or San Antonio.
Source: Carnegie. Classification of Institutions of Higher Learning, University of Indiana.



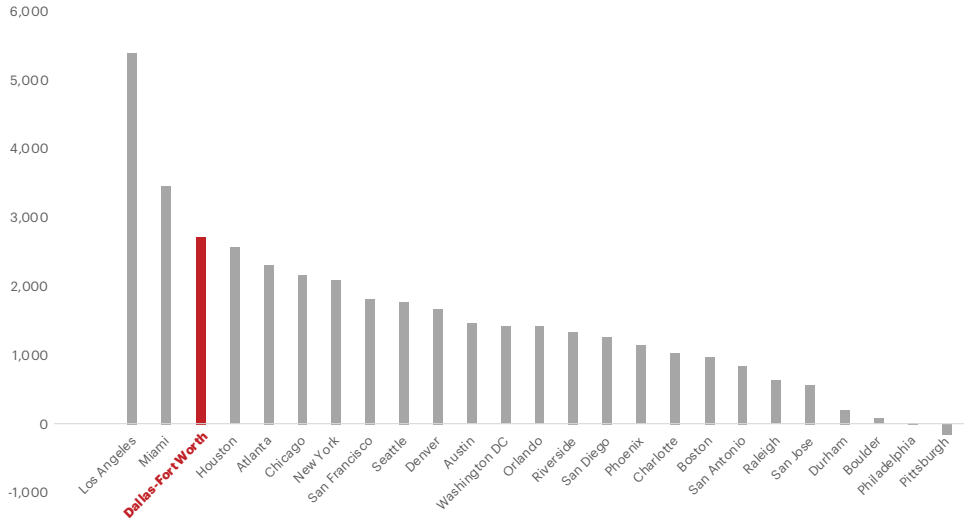
THE ENTREPRENEURIAL DRIVE

Ambition, drive, purpose—these are just a few of the qualities that define what it means to be an entrepreneur. Entrepreneurs are risk-takers who not only start businesses to address a perceived need in the marketplace, but also serve as primary job generators. According to the Small Business Administration, small businesses make up more than 99 percent of US employer firms and create 62 percent of net new private-sector jobs. Because entrepreneurs often seek to provide new and disruptive approaches to marketplace challenges, the strength of a metro's entrepreneurial ecosystem can provide insight into the innovation potential of that region. This section addresses small-business formation and health, as well as entrepreneurial activity by metro.

THE STATE OF ENTREPRENEURSHIP

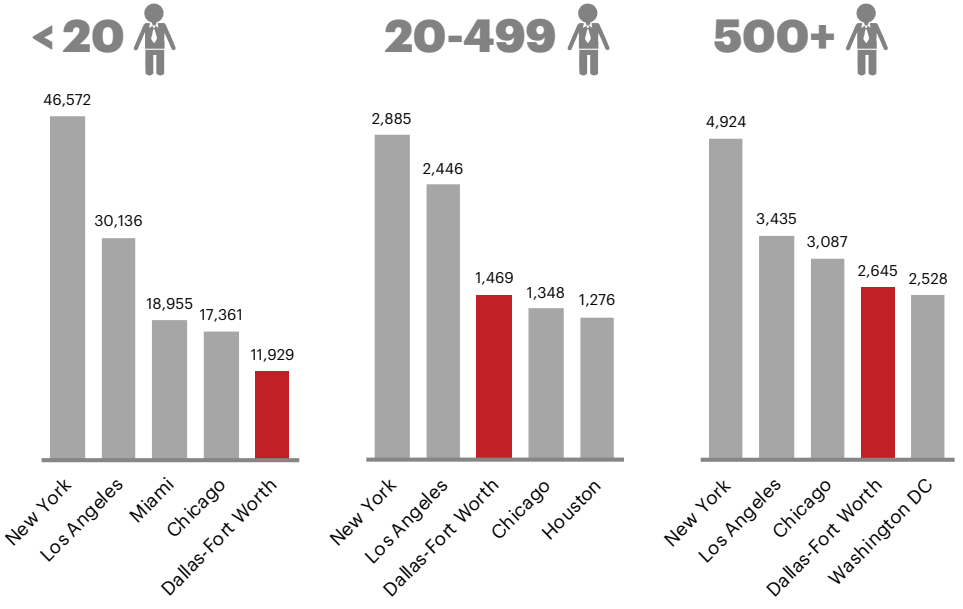
The very nature of entrepreneurism indicates a drive to innovate to overcome marketplace challenges. Individuals willing to risk starting new ventures accept that failure is a potential outcome. But for those who succeed, the reward of growing a startup into an established business can be substantial. The count of net new businesses in a region—the number of establishment births minus establishment deaths in a given year—provides insight into the entrepreneurial spirit and to the support network available to entrepreneurs in the region. Net new businesses created in 2014-2015, the latest data available, is presented below. The Kauffman Foundation, known for its entrepreneurial expertise, further delineates the innovation potential of metros by tracking the proportion of entrepreneurs among the adult population, as well as the proportion of entrepreneurs who start a business because they see an opportunity and not as a response to unemployment. Data from 2010-2016 are presented for select metros following the small business graphics.

Net new small businesses by comparison metro



Source: SUSB Employment Change Data Tables, US Census Bureau, 2014-2015.

Total small business births by number of employees for top 5 metros



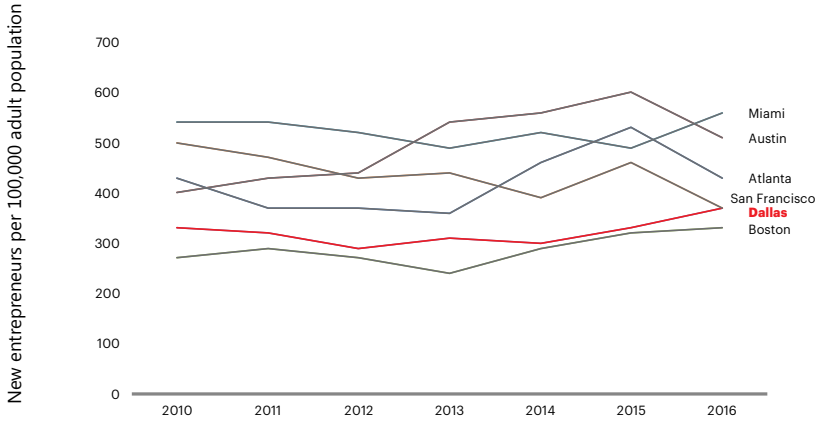
Establishments With Less Than 20 Employees

Establishments With 20-499 Employees

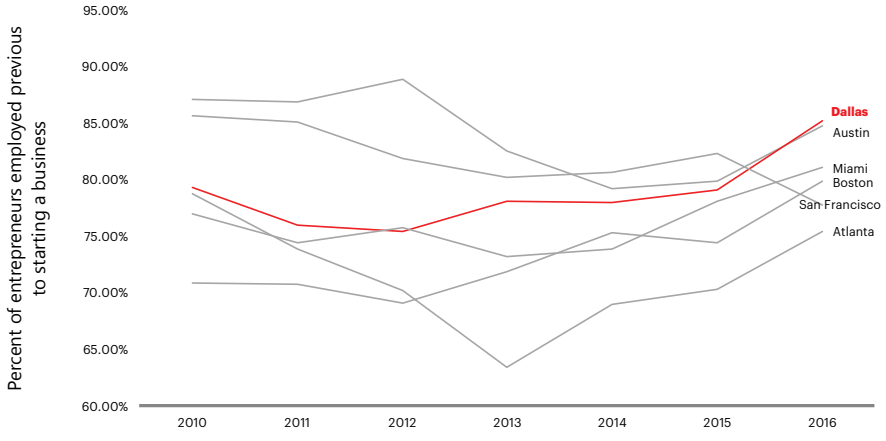
Establishments With 500 Or More Employees

Source: SUSB Employment Change Data Tables, US Census Bureau, 2014-2015. See Appendix Table 4 for full data set.

New entrepreneurs per 100,000 adult population by select metro



Opportunity share of new entrepreneurs by select metro*



**Note: People who started a business while still employed.*
Source: Kauffman Foundation, 2010–2016.
See Appendix Tables 5 and 6 for full data sets.

REWARDING SUCCESS

Many industry lists recognize and honor success, innovation and growth in startups and small businesses. Entrepreneur Magazine's Entrepreneur 360 and Inc. Magazine's Inc. 5000 are two of the best known. The Entrepreneur 360 awards are reserved for small businesses that are exceptional performers in the areas of impact, innovation, growth and leadership. Inc. 5000 ranks the nation's fastest-growing private companies. To qualify, companies must be US-based, privately held and independent, and should be able to show three full calendar years of sales. The number of companies produced by a region that qualify for these lists serves as a testament to the local drive to innovate.

Number of best performing and fastest growing small businesses by comparison metro

Entrepreneur 360

New York	50
Los Angeles	40
San Francisco	22
Dallas-Fort Worth	**14**
Chicago	12
San Diego	12
Washington DC	12
Austin	11
Boston	9
Charlotte	9
Miami	9
Atlanta	8
Philadelphia	8
San Jose	8
Denver	7
Phoenix	7
Seattle	7
Houston	5
Orlando	2
Raleigh	2
Riverside	1
San Antonio	1
Boulder	0
Durham	0
Pittsburgh	0

Inc. 5000 Companies

New York	364
Washington DC	324
Los Angeles	306
Chicago	228
Atlanta	221
Dallas-Fort Worth	**185**
Boston	149
Philadelphia	146
Miami	125
San Francisco	125
Houston	112
Phoenix	110
San Diego	100
Austin	94
Seattle	93
Denver	82
Orlando	67
Charlotte	45
San Jose	37
Pittsburgh	34
Riverside	18
San Antonio	18
Boulder	13
Durham	0
Raleigh	0

Source: Entrepreneur Magazine, 2017; Inc. Magazine, 2017.

05

Capital Inputs

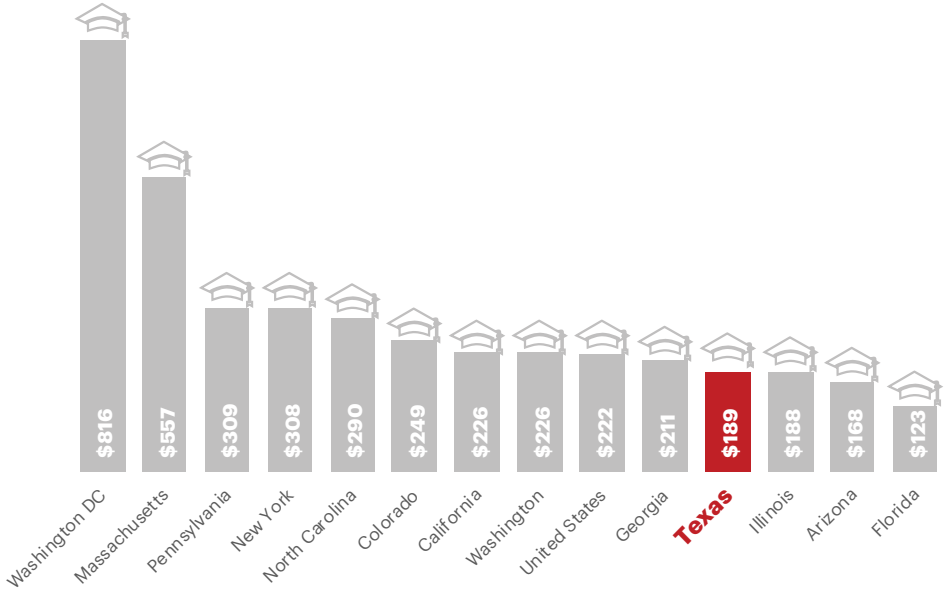
FUNDING THE FUTURE

Funding is a crucial input across the innovation landscape. Both corporate and university R&D efforts require a stable financial support system to ensure that life-improving technologies, such as medical breakthroughs, make it to market. Capital is just as crucial for the entrepreneur, who requires investment through each stage of bringing an idea to fruition. The flow of funding into innovation activity is an important consideration for any region that is continually working to remain competitive. This section addresses access to capital.

THE UNIVERSITY CONTRIBUTION

Universities have always served the function of accumulating knowledge and encouraging discovery. Today, metropolitan areas and their states count strong universities as essential for creating a talent pipeline that can meet the demands of an Innovation Economy. Additionally, technology transfer and commercialization can generate enormous economic impacts as well as encourage industry–university collaboration. R&D expenditures by educational institutions reflect regional productivity in innovation output. Per capita expenditures are influenced by the concentration of R&D facilities for the population served.

Per capita R&D expenditures at colleges and universities by comparison metros' home state

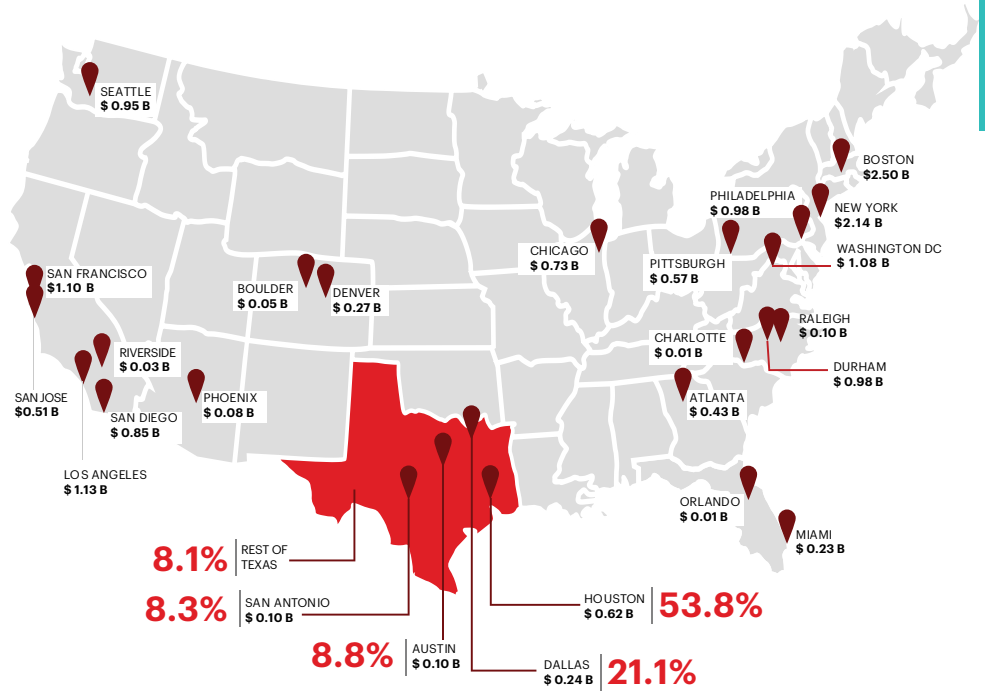


Source: National Center for Science and Engineering Statistics, National Science Foundation, 2016.
See Appendix Table 7 for full data set.

FUNDING HEALTH INNOVATION

Improving access to life-saving drugs, containing the cost of new drug development and protecting patient privacy in the digital age are just a few of the challenges facing the health industry. The need to continuously innovate may be nowhere more apparent than in this industry, charged with human health care. The National Institutes for Health (NIH) is the largest public funder of biomedical research to support such innovations, so the dollar amount of NIH awards flowing to a metro can hint at biomedical advances originating in that region.

Total NIH grant award amounts for comparative metros, with percent of state funding by Texas metro areas

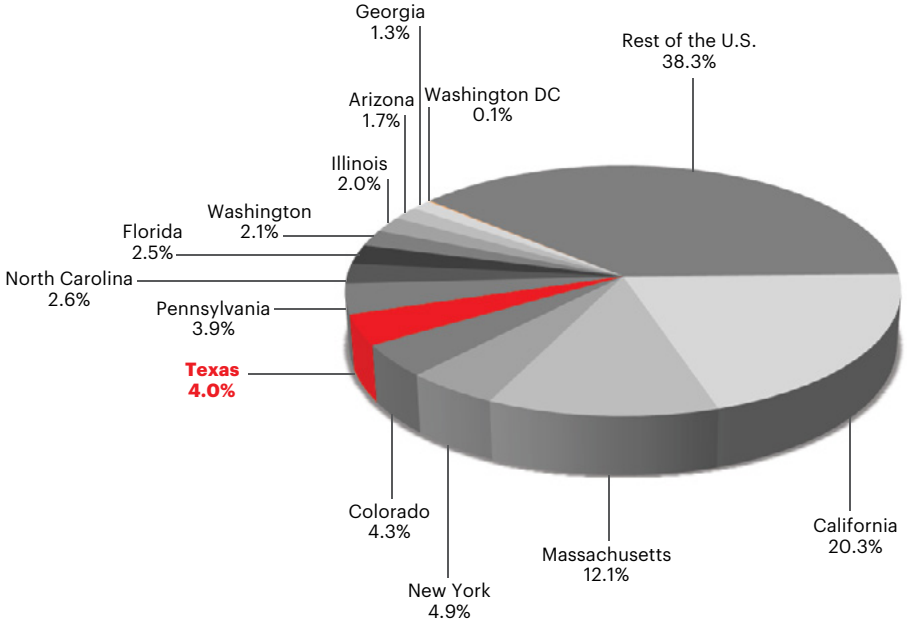


Source: National Institutes of Health, 2017.
See Appendix Table 8a and 8b for full data sets.

SMALL BUSINESS, BIG IMPACT

The Small Business Administration (SBA) recognizes the link between entrepreneurial innovation and a positive impact on economic growth. With an annual set aside of $2.2 billion, the SBA offers substantial encouragement for small businesses to bring innovative technological solutions to market through two highly competitive funding opportunities. The Small Business Innovation Research and Small Business Technology Transfer programs distribute funding through various federal agencies to boost collaboration and commercialization. Nearly half of all awards flow to only six states, which includes Texas.

Percent of SBIR and STTR awards by comparison metros' state

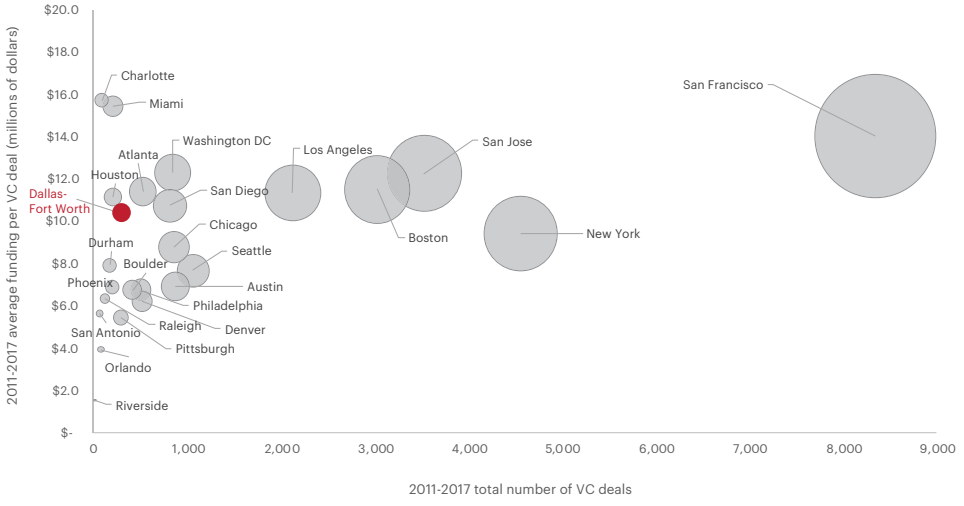


Source: US Small Business Administration, 2008–2017.
See Appendix Table 9 for full data set.

VENTURE SEEKING POTENTIAL

The Kauffman Foundation notes that without risk-takers who found startup businesses, there would be no net job growth in the US. The venture capital (VC) industry is an important source of funding for the startup world, and thus, an important piece of the US economy. Venture capitalists often step in to fund innovative startups that typically have limited access to traditional forms of capital, such as bank credit. VC funding also plays a significant role in the next stage of innovation—concept commercialization. The vast majority of investment flows to the East and West Coast metros with mature startup ecosystems. Interior metros are striving to strengthen homegrown startup communities to gain VC attention.

Venture capital investments by comparison metros



Size of bubble represents total dollar amount of deals.
Source: PwC/CB Insights MoneyTree™ Report, 2011–2017.
See Appendix Table 10 for full data set.

06

Business Climate

FRAMEWORKS FOR SUCCESS

Business leaders pay particular attention to the legal and regulatory conditions in the regions in which they operate. They also try to predict how potential changes to these conditions might affect a company's ability to function. Onerous conditions may spur the decision to consider relocating to another market where tax structures, policy prescriptions, legislative responsiveness or other business climate factors are more favorable. High taxes, for example, can affect overall operating costs, which may affect the scale of production or ability to hire more workers. Of course, taxes aren't the only consideration. The cost of doing business can be affected by many inputs, including labor, energy, transportation and facilities. Furthermore, regional leaders can create legal and regulatory frameworks that maximize the use of local assets, resulting in exceptionally favorable conditions for specific industries. In this section, we look at tax burdens, the cost of doing business and innovation-related industry advantages by metro area.

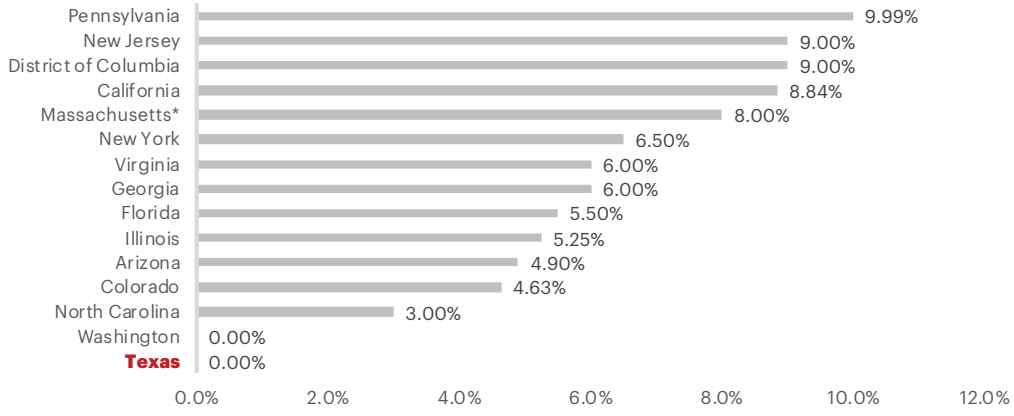
COST OF DOING BUSINESS

The cost of doing business can be influenced by a number of factors—labor, energy, tax and rent—though tax policy usually takes center stage. Among the states that are home to DFW's comparative metros, corporate income taxes vary widely, from zero percent in Texas and Washington to 9.99 percent in Pennsylvania. Similarly, for taxes that have a more direct impact on innovation activity, states have wide ranging tax policies. For instance, tax rates for new and mature R&D facilities can vary from as little as 0.8 percent in Georgia to 22.9 percent in New York, a reflection of differing philosophies about how best to support R&D activity. Texas's low business tax burden plays a central role in keeping the overall cost of doing business in most Texas metros lower than the US average. The US cost of business index score is set at 100. Metros with a higher index have a higher cost of doing business, while the reverse is also true.

Cost of doing business by comparison metros

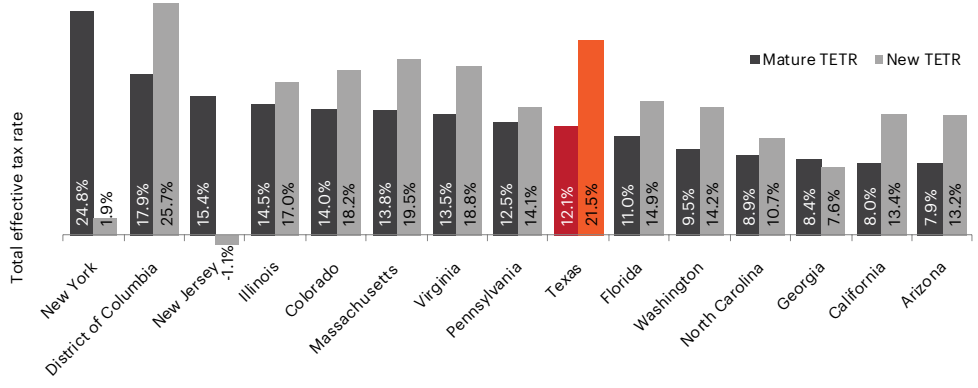
Source: Moody's Analytics, 2017.

Corporate tax burden by comparison metros' state



**Note: Plus $2.60 per $1,000 of property or net worth.*
Source: Thomson Reuters, 2018

Total effective tax rate for new and mature R&D facilities by comparison metros' state*

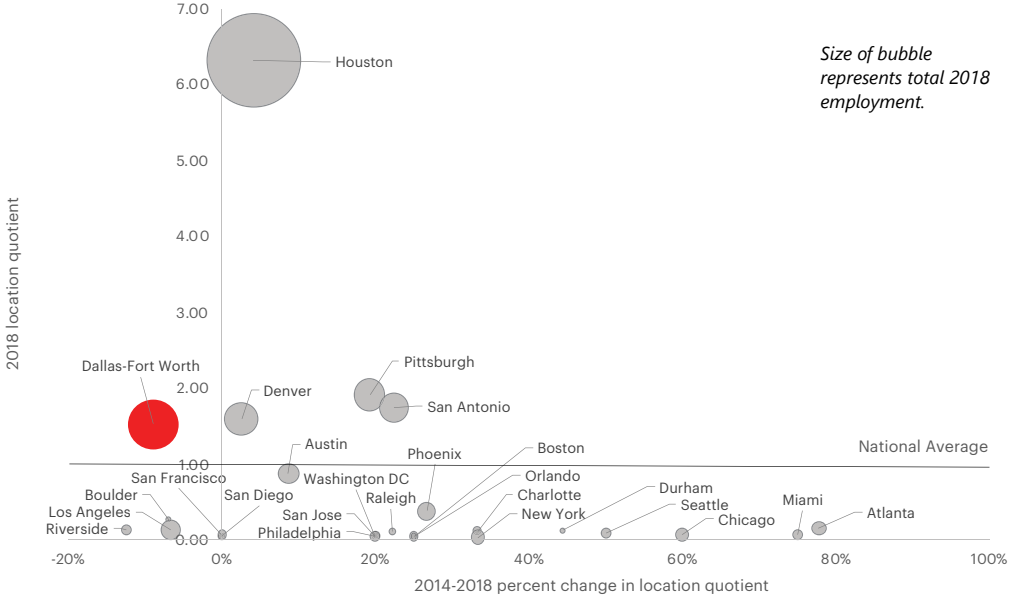


**Note: New facilities are less than 10 years old; mature facilities are more than 10 years old.*
Source: Tax Foundation/KPMG, 2015.

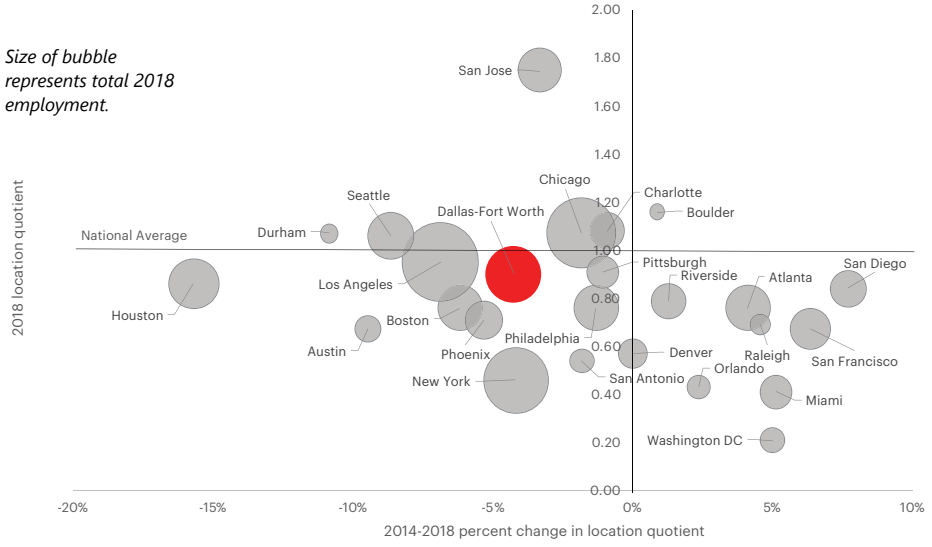
THE DISTRIBUTION OF INDUSTRIES

A location quotient (LQ) is used to quantify the concentration of regional industries in relation to the rest of the nation. With the US representing an average of 1.0 for all industries, the further a metro deviates from this average reflects how dependent its economy is on one particular industry. The LQ can shed light on issues such as abundance of a particular resource, including the quantity of graduates in a particular field, proximity to a natural resource, or political and policy decisions supporting the industry. For example, see Houston's dominance in and reliance on the oil and gas industry below. High employment in a specific industry typically indicates the region's economic base, which can strengthen or weaken in a relatively short period of time. For example, see Boulder's rapid decline in the finance industr y. The following industries exhibit the propensity to spur the greatest share of technological innovations.

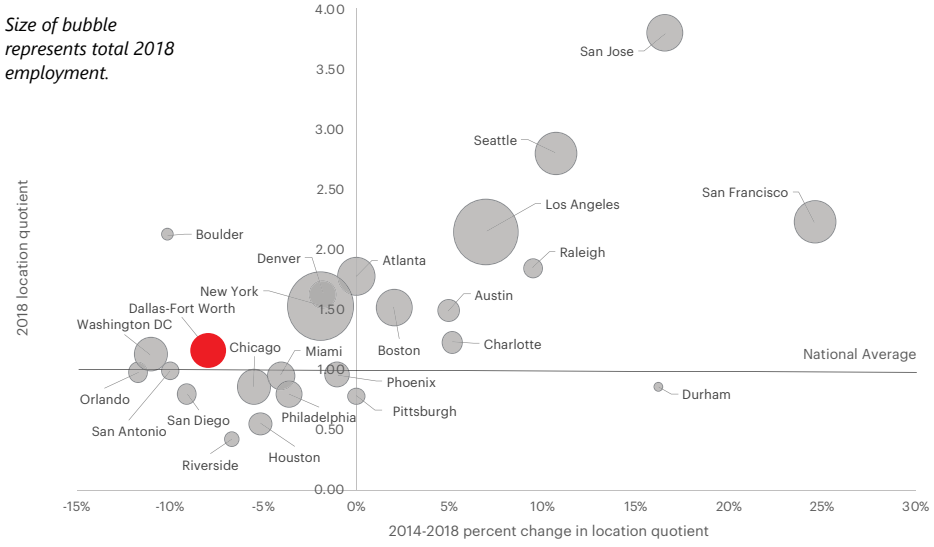
Mining, quarrying, and oil and gas extraction industry LQ and employment



Manufacturing industry LQ and employment

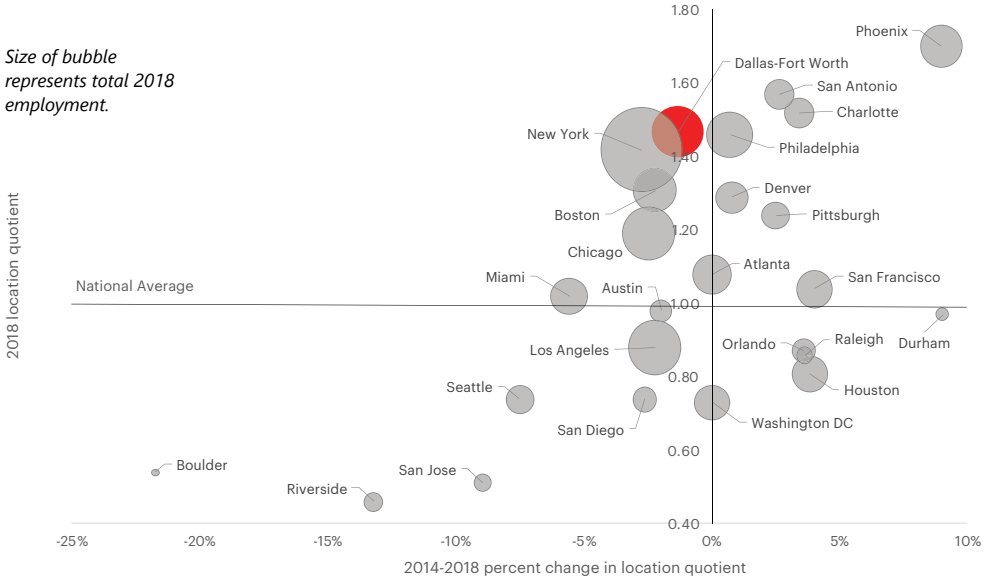


Information industry LQ and employment



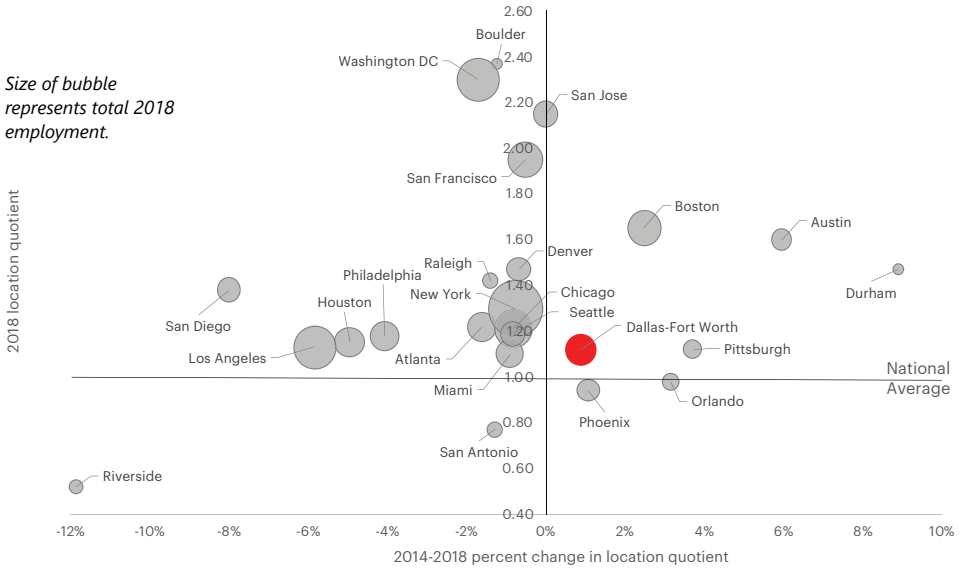
Finance and insurance industry LQ and employment

Size of bubble represents total 2018 employment.



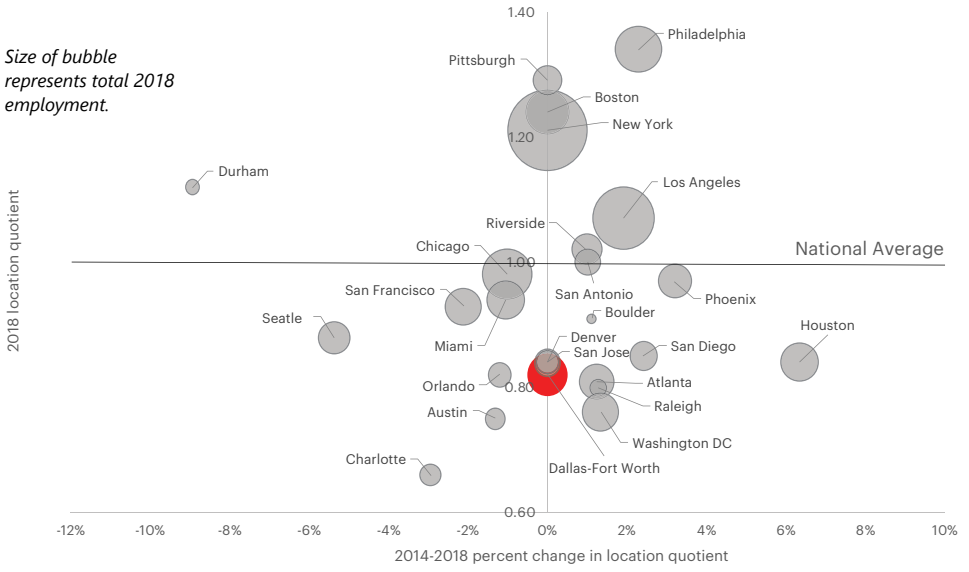
Professional, scientific and technical services industry LQ and employment

Size of bubble represents total 2018 employment.



Health care and social assistance industry LQ and employment

Size of bubble represents total 2018 employment.



Source: EMSI, 2018Q2.

07

Workforce

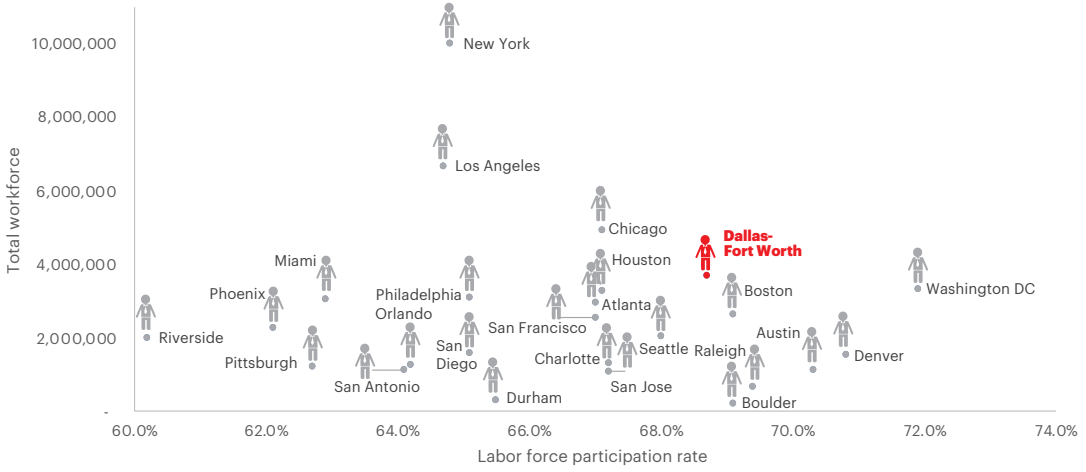
LABOR POOL
TALENT

As discussed in the attractiveness section, people power regional economic growth. Metros that focus on growing or attracting talent who are willing to ask hard questions, who pursue answers to challenges and who take risks never before attempted are cultivating a robust labor pool. These individuals will have the right combination of skills and motivation essential for supporting an Innovation Economy. A large metro workforce that includes a healthy mix of workers trained in science, technology, engineering and mathematical disciplines—as well as those with creative and entrepreneurial spirits—suggests an above-average innovation potential. This section explores regional workforce characteristics.

SCALE AND SHARE

A large regional workforce can be an attractive feature for a business facing a relocation decision. However, the percentage of the working-age population actually engaged in the workforce (known as the labor force participation rate) indicates a region's level of motivation to get things done. Although the national rate has been declining since the early 2000s, it varies widely across metros. On the low end, only 60 percent of Riverside's working-age population make up its 2.0 million labor pool. On the other end of the spectrum, 72 percent of Washington, DC's working-age population comprises the 3.3 million labor pool. At 69 percent, DFW sits near the higher end of the labor force participation rate scale, with the fourth largest labor pool of 3.7 million workers.

Annual workforce and labor participation rate by comparison metro

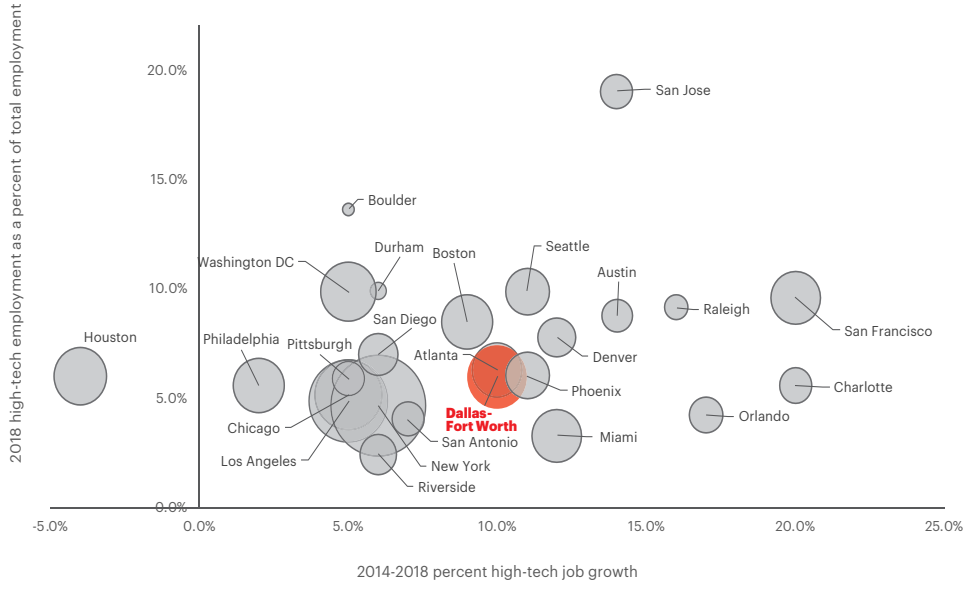


Source: LAUS, Bureau of Labor Statistics, 2016.
See Appendix Table 11 for full data set.

THE RIGHT KIND OF WORKER FOR THE JOB

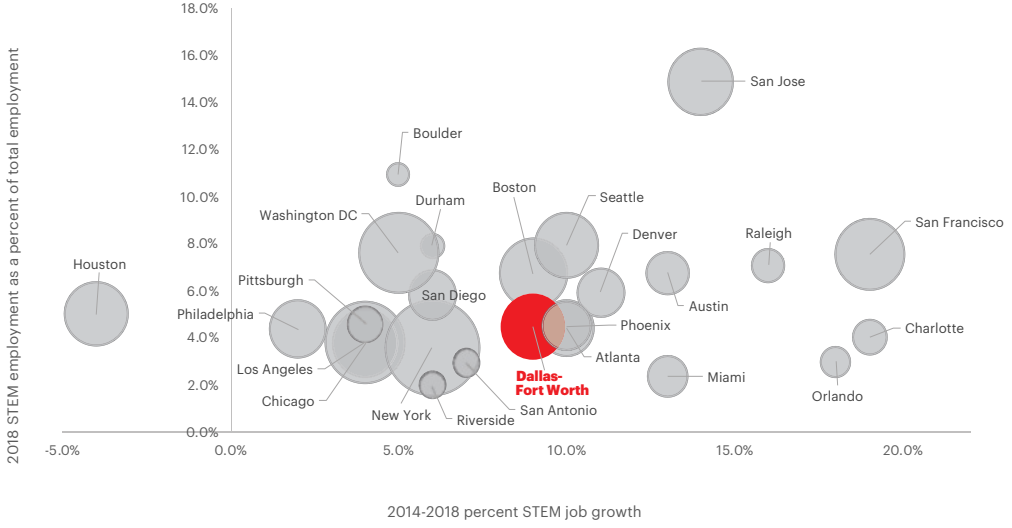
Today's technology-driven economy is increasingly dependent on workers with specialized knowledge to fulfill the demands of the job. As a driver of innovation, technological expertise is attained through a combination of formal education in a high-tech, STEM or creative field and real world experience. Several factors contribute to how strong a region's specialized workforce might be, including its number of workers with specialized skills, the percentage of specialized workers in relation to the entire population of workers, and the growth of employment in specialized fields. DFW ranks among the top 10 metros in terms of total high-tech, STEM and creative jobs, and has posted double-digit growth in high-tech employment over the past five years.

High-tech occupation employment, growth and percentage of total employment in comparison metros



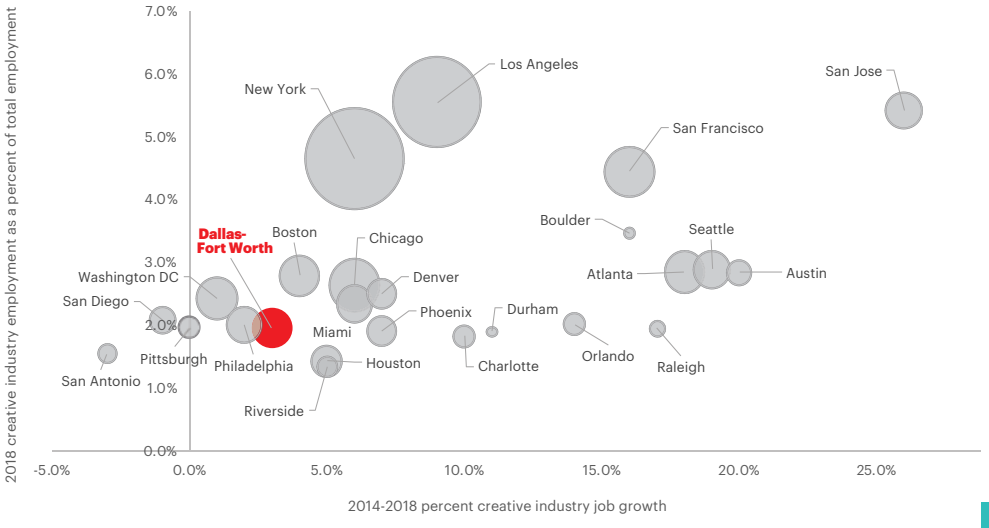
Size of bubble represents total high-tech industry employment in 2018.

STEM occupation employment, growth and percentage of total employment in comparison metros

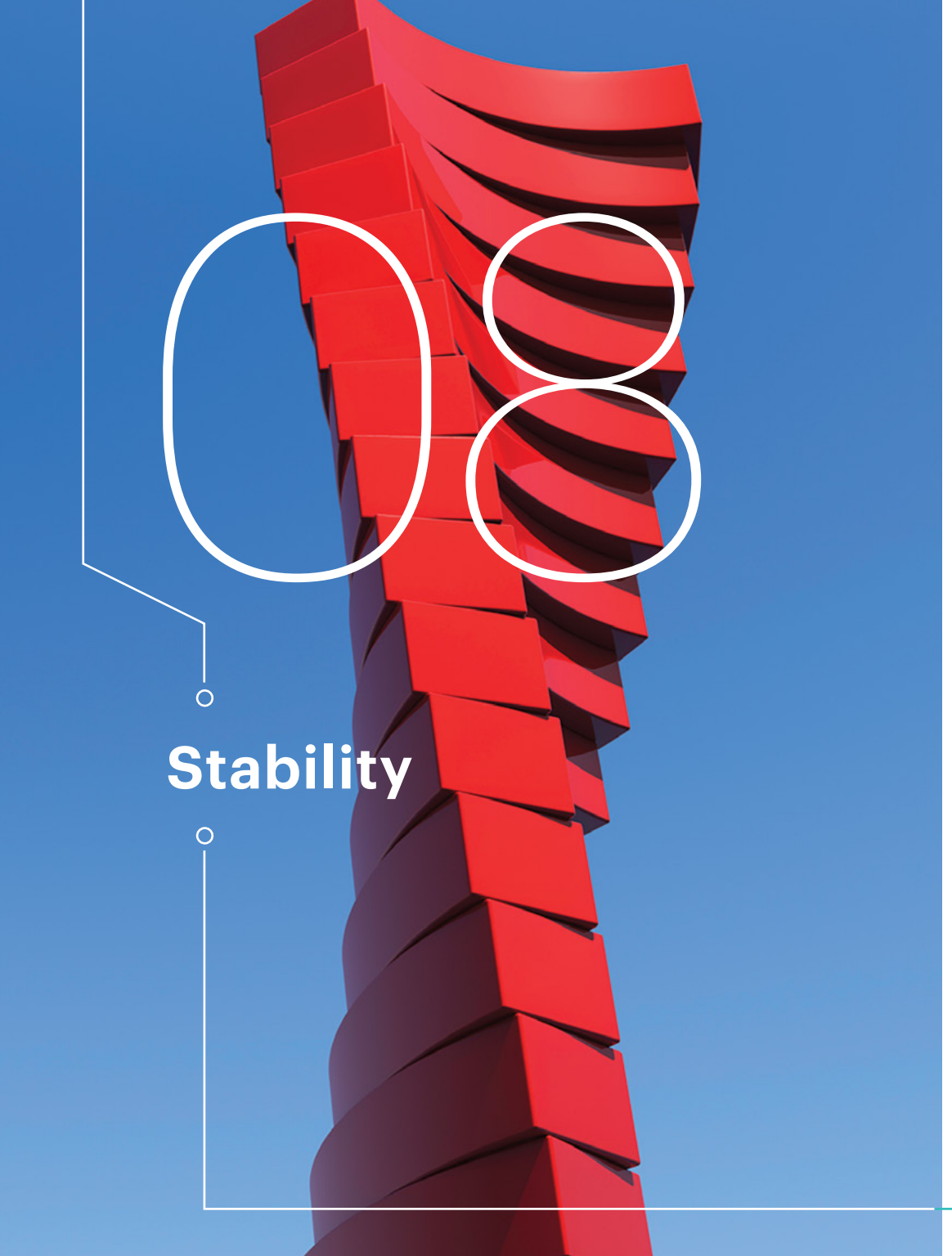


Size of bubble represents total STEM employment in 2018.

Creative class occupation employment, growth and percentage of total employment in comparison metros



Note: Size of bubble represents total creative industry employment in 2018.
Source: EMSI, 2018Q1.
See Appendix Tables 12, 13 and 14 for full data sets.



08

Stability

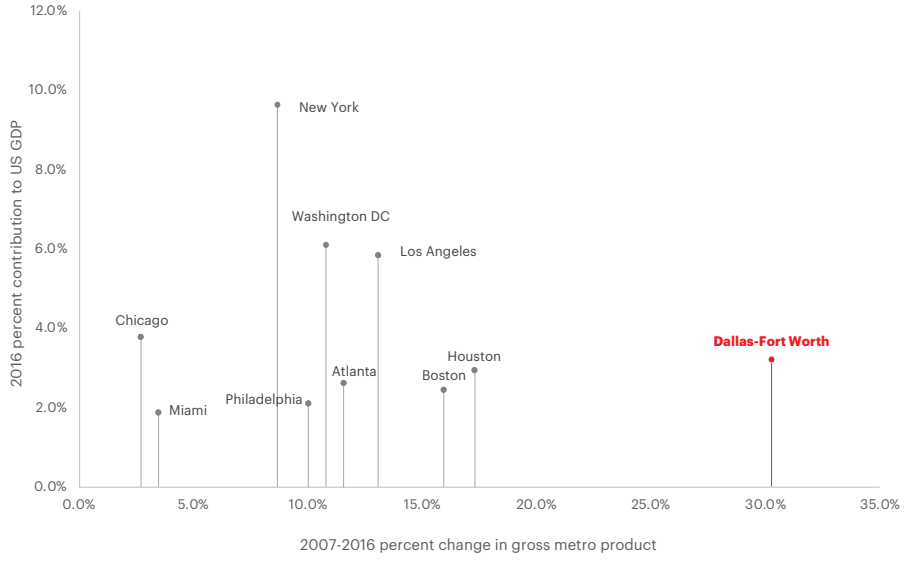
ECONOMIC GROUNDING

Although innovation is often a product of necessity, a firm economic base can provide a longer runway for entrepreneurs to achieve their vision. Elements of a firm base include industry diversity, strong productivity, growing employment, and wages that are commensurate with the cost of living. Also, the economic stability of a region can be an attractive feature for businesses and individuals looking to relocate. This section addresses regional productivity, wealth, income, employment, cost of living and poverty.

PRODUCTIVITY AND WEALTH

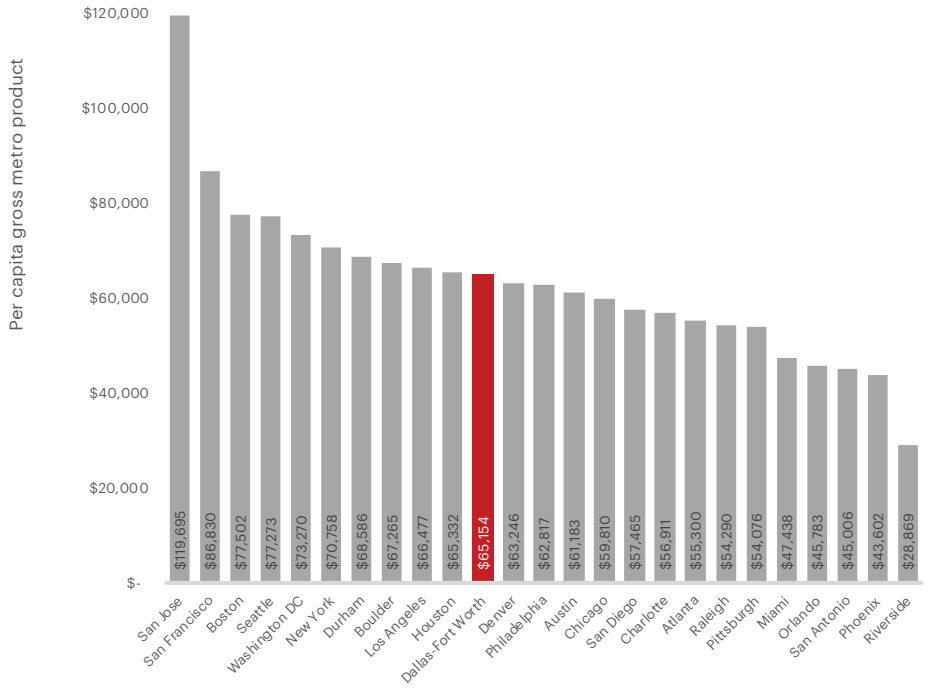
Gross metro product, or GMP, is the value of all goods and services produced within a metropolitan area and signals the level of economic productivity in a region. In general, metro areas drive the US economy. In fact, the 10 largest metros contribute nearly 38 percent of the US GDP. New York and Los Angeles are ahead of the other metros in terms of their contribution to national GDP, with 9.6 percent and 6.0 percent, respectively. DFW ranks fourth, at 3.2 percent of GDP. Important to note, though, is that underlying DFW's contribution is a seven-year GMP growth rate of more than 30 percent, the fastest among the top 10 metros. DFW's per capita GMP stands at $65,154, indicating the region is both highly productive and is creating wealth.

Gross metro product and contribution to national GDP for the 10 largest US metros



Source: Bureau of Economic Analysis, 2007-2016.

Per capita GMP in comparison metros*

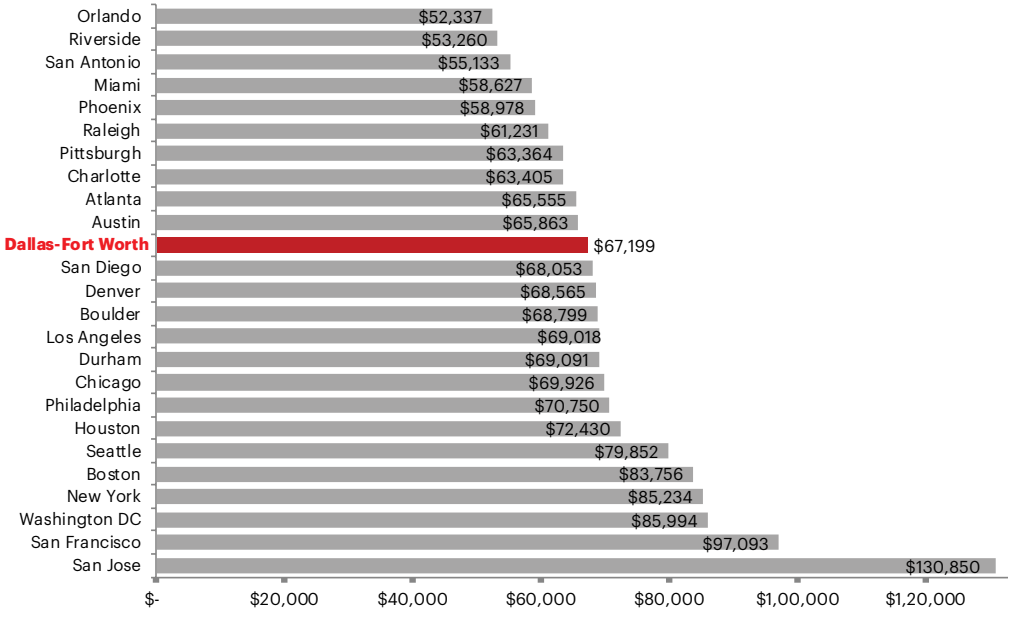


**Note: Real GMP (millions of chained 2009 dollars).*
Source: Bureau of Economic Analysis, 2016.
See Appendix Table 15 for full data set.

WAGES AND SALARIES

Average annual salary and median hourly wage are important measures for describing the stability of a regional economy, and can be affected by cost of living, and occupation and industry composition. Average salaries provide an overview of the income generated by the entire region as if it were equally distributed, but higher-earning individuals have a stronger influence on the mean value than those with lower earnings. The median wage, or middle value, is more reflective of what the typical person might earn. Average annual salaries range from a low of $52,237 in Orlando to a high of $130,850 in San Jose, and median hourly wages range from a low of $15.10 in Orlando to a high of $28.70 in San Jose. DFW falls in the middle of the pack, for both measures, at $67,199 and $18.46, respectively.

Annual average salary in comparison metros



Source: EMSI, 2018Q2.

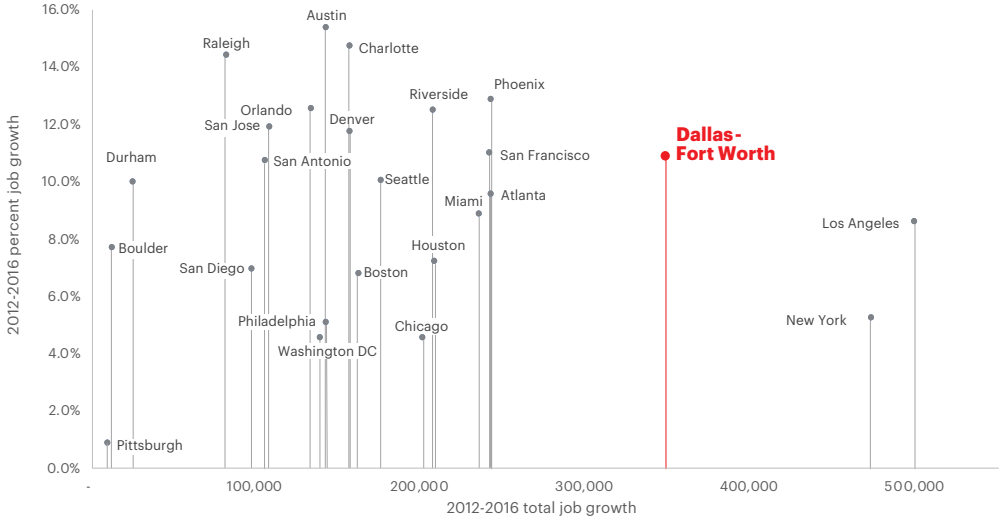
Median hourly wage in comparison metros

Source: OES, Bureau of Labor Statistics, 2016.

EMPLOYMENT AND UNEMPLOYMENT

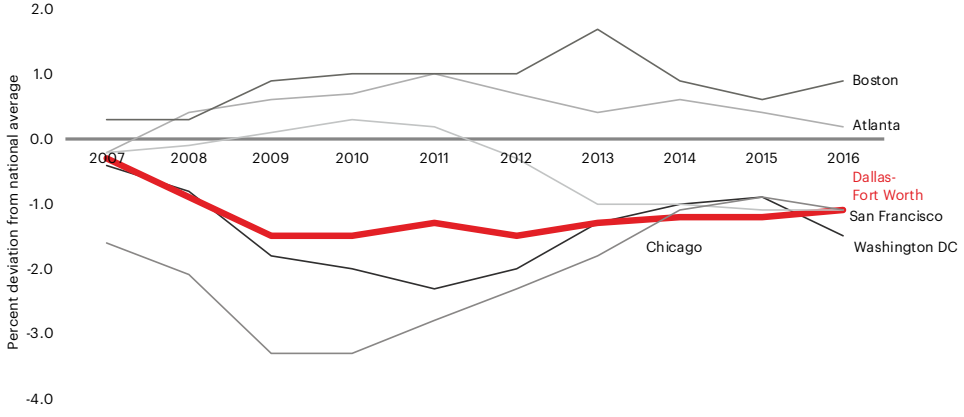
Employment growth among metros represents an important indicator of a healthy economy both from the standpoint of business creation and expansion, and from the ability of a region to create and attract the talent necessary to meet demand. The unemployment rate is the share of the labor force that is jobless. It also serves as an indicator of whether the regional workforce possesses the skills that employers require. In the past five years, employers in DFW have created almost as many jobs as were created in either Los Angeles or New York—two much larger metros in both population and GMP. Unemployment in DFW has remained low, nearly a full percentage point below the national average.

Total and percentage employment growth in comparison metros



Source: LAUS, Bureau of Labor Statistics, 2012–2016.

Annual unemployment rate deviation from national rate by select metro

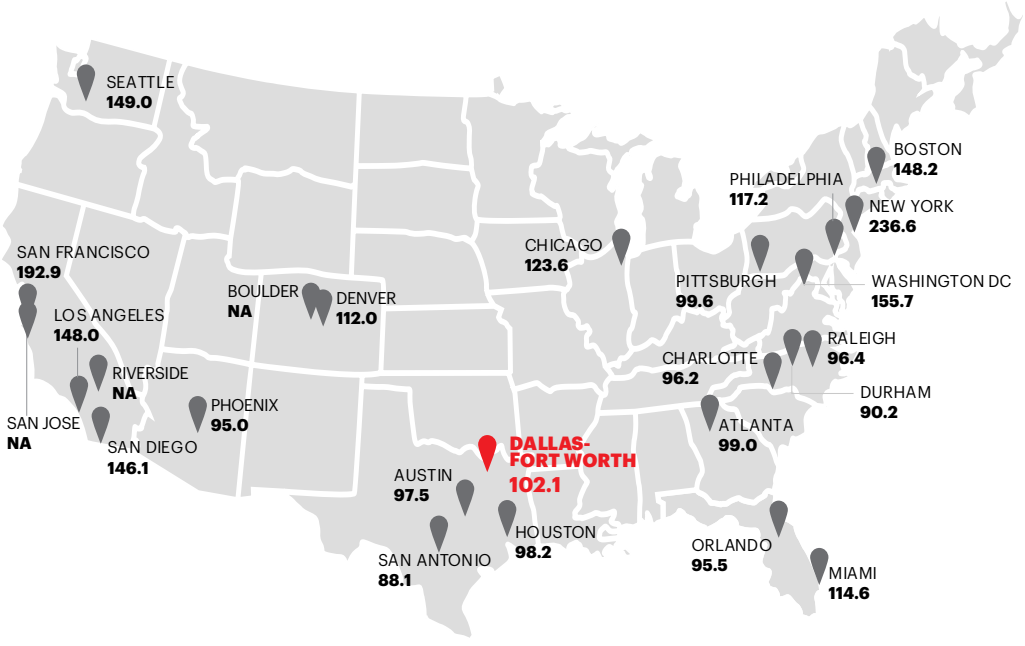


Source: LAUS, Bureau of Labor Statistics, 2012–2016.
See Appendix Table 16 for full data set.

COST OF LIVING

People consider many different factors in their decisions to relocate. C2ER's Cost of Living Index (COLI) helps by comparing prices of a set of goods, services, housing and other expenses among participating US metros. C2ER partners with local organizations that volunteer to collect data on the ground. The resulting bundles of living expenses for each metro are compared with the national average (equal to 100) and to one another. The further a score exceeds the average, the more someone can expect to pay for living expenses. With an index score of 102.1, DFW has the third-lowest COLI among the top 10 most-populated metros, after Atlanta (99.0) and Houston (98.2). DFW's cost of living is a compelling factor in maintaining an Innovation Economy.

Cost of living index in comparison metros

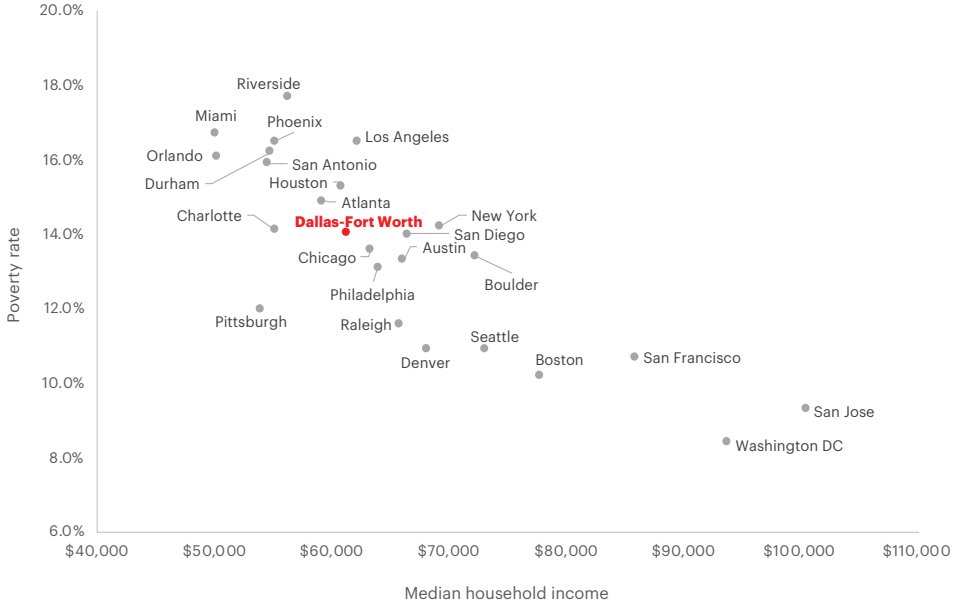


Source: Annual Cost of Living Index, C2ER, 2017.

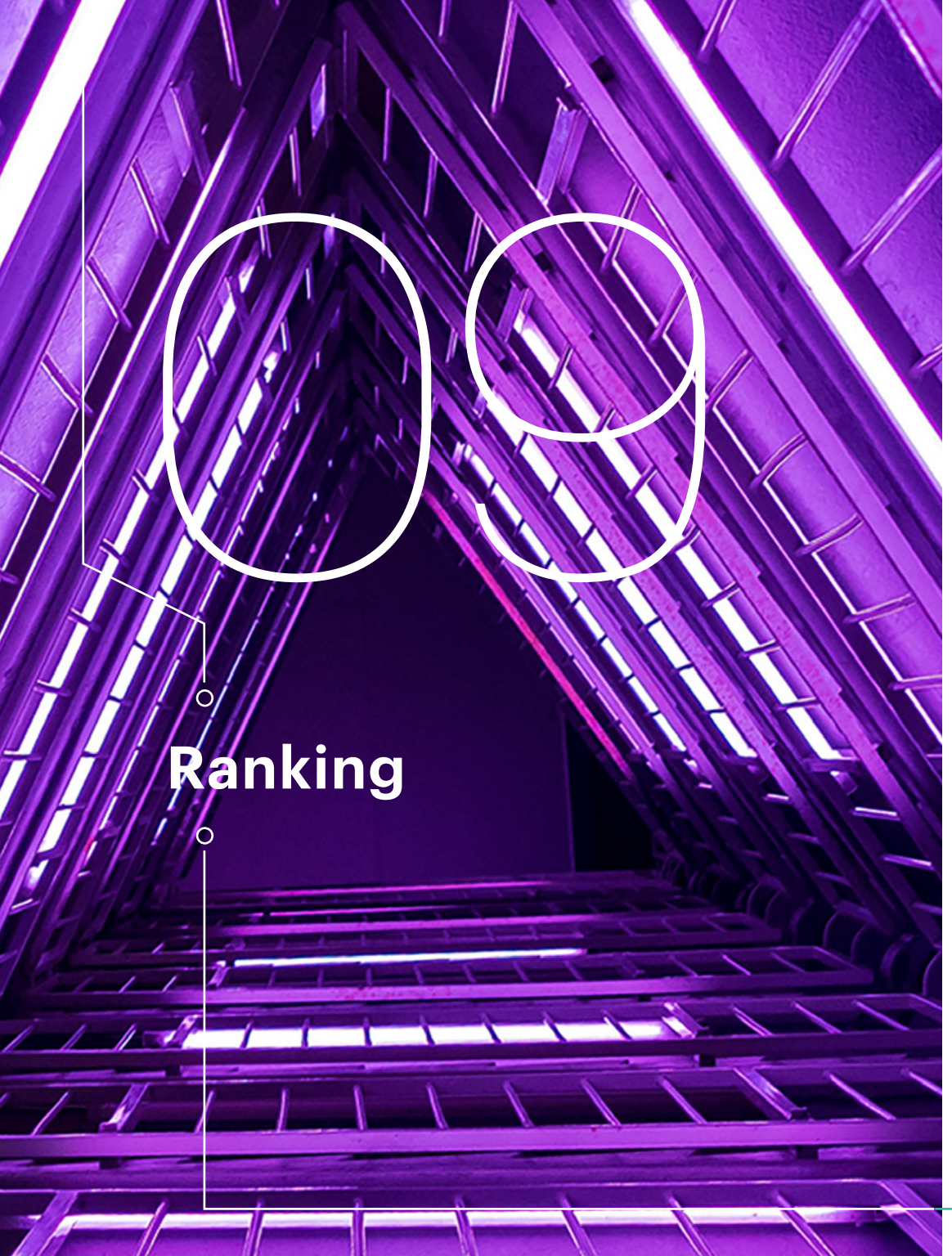
THE POVERTY CHALLENGE

The poverty rate is the ratio of people who fall below the poverty line to the total population. The poverty line is based on estimates of the level of income needed to cover basic needs, as determined by the federal government. Poverty plagues all metros regardless of how innovative they are perceived to be. The poverty rate can highlight inequities in resource distribution within a metro and can negatively impact innovation potential. The poverty rate of most major metros is currently between 10.0 percent and 16.0 percent, with a high of 17.7 percent in Riverside to a low of 8.4 percent in Washington, DC.

Poverty rate among comparative metros



Source: American Community Survey 5-Year Estimates, US Census Bureau, 2012–2016.



Ranking

As the metrics in the preceding sections have shown, regional innovation is the outcome of many interrelated forces. Attractiveness, capital inputs, business climate, ideas, knowledge, purpose, stability and workforce are all important—but not exclusive—components that feed an Innovation Economy. For a more comprehensive look at DFW's innovation capacity and for purposes of comparison with similar cities, we created the DFW Regional Innovation Scorecard. The Scorecard captures how experts position DFW as a center of innovation. By benchmarking DFW against peers, the scorecard serves as a barometer to gauge our region's ability to generate and adapt to continuous innovation. It also forms a baseline against which we can evaluate forthcoming work.

GLOBAL AND LOCAL CITY RANKINGS

RANKING	Dallas-Fort Worth	Atlanta	Austin	Boston	Boulder	Charlotte	Chicago	Denver	Durham	Houston	Los Angeles	Miami	New York	Orlando	Philadelphia	Phoenix	Pittsburgh	Raleigh	Riverside	San Antonio	San Diego	San Francisco	San Jose	Seattle	Washington DC
Milken - Best Performing Cities (2017) Provides an objective benchmark for examining the underlying factors and identifying unique characteristics of economic growth in metropolitan areas. Index uses a fact-based set of metrics including job creation, wage gains, and technology developments to evaluate the relative growth of metropolitan areas (*metropolitan division where noted).	3*	14	9	44*	42	13	109*	23	106	113	61*	59*	82*	7	98*	40	143	2	20	19	51	4*	11	17*	118
2thinknow - Innovation Cities Index (2016-17) Classifies and ranks 500 global cities' potential as innovation economies. Analysis is based on a city's potential for creation, implementation and communication of ideas in their urban economies.	16	18	47	5	94	135	20	42	58*	22	6	26	2	61	34	63	100	58*	98	95	36	4*	4*	21	27
Kauffman - Index of Startup Activity (2017) Focuses on new business creation activity and people engaging in business startup activity in the 40 largest U.S. metro areas. Index comprises the rate of new entrepreneurs in the economy; the rate of new entrepreneurs driven primarily by "opportunity" vs. "necessity;" and the startup density of a region.	11	12	2	21	--	17	31	10	--	9	3	1	7	22	36	8	39	--	13	6	4	14	16	24	25
Kauffman - Index of Main Street Entrepreneurship (2017) Measures established small business activity in the 40 largest U.S. metro areas– focusing on businesses more than five years old with less than fifty employees.	29	33	9	2	--	35	14	15	--	24	7	10	18	37	17	38	1	--	34	36	13	4	30	21	5
Kauffman - Index of Growth Entrepreneurship (2017) Relies on three composite indicators to look at business revenue and job growth: rate of startup growth, share of scaleups, and high-growth company density in the 40 largest U.S. metro areas.	10	15	2	6	--	11	30	13	--	14	33	39	35	34	21	12	27	--	38	9	7	8	3	22	1
StatsAmerica - Innovation 2.0 (2016) Comprises five major categorical indexes organized thematically (Human Capital & Knowledge Creation; Business Dynamics; Business Profile; Employment and Productivity; and Economic Well-Being) culminating in a top-level "headline" number that includes both innovation inputs and outputs in order to measure both innovation capacity and output potential for 380 U.S. metros.	17	38	5	13	4	22	62	10	8	21	27	65	26	64	56	43	72	9	115	44	14	1	2	15	16
Dell - Future Ready Economies (2016) Analyzes more than 40 sets of data covering human capital, commerce, and infrastructure to uncover what the most innovative cities are doing right, and what others can do to make themselves future ready.	16	20	7	6	--	21	22	14	--	19	35	--	17	43	--	--	36	8	--	42	--	2	1	13	5
CBRE - Scoring Tech Talent (2017)* Analyzes labor market conditions for highly-skilled tech workers in the 50 largest U.S. and Canadian markets. Rankings are based on competitive advantages of the market and appeal to tech employers and tech talent (*real estate markets as opposed to metro areas).	10	5	8	9	--	26	15	12	7	31	24	48	3	32	22	17	30	7	--	47	19	1	1	3	4
Cushman & Wakefield - Tech Cities 1.0 (2017)* Takes a close look at market drivers that cause certain cities to stand out in terms of how large of a role tech plays in the city's economic trajectory. Rankings are based on a set of "tech stew" metrics that characterize an environment of support, nurturing and promotion of tech cities (*real estate markets as opposed to metro areas).	21	17	7	4	8	--	16	8	5	--	18	--	15	--	--	--	--	5	--	--	9	2	1	6	3
ATKearney - Global Cities Outlook (2017) Evaluates a city's potential based on the rate of change for 13 metrics across personal well-being, economics, innovation, and governance dimensions. Outlook identifies growing cities that are likely to become the world's most prominent based on city-level policies and practices that shape future competitiveness.	26	17	--	5	--	--	15	--	--	8	25	39	2	--	36	34	--	--	--	--	--	1	--	--	19
U.S. Chamber of Commerce - Innovation that Matters (2017) Examines the health of startup communities in 25 U.S. cities and assesses their readiness to capitalize on an increasingly digital economy. Focuses on the level of support for "next-wave" startups in the health, education, energy, and smart-cities sectors. Analysis and rankings are based on a survey of 413 startup founders and leaders as well as third party data, taking into account 6 factors: Capital, Connectivity, Culture, Density, Industry Specialization, Talent.	7	6	5	1	--	--	14	11	13	21	15	20	9	--	3	25	12	13	--	--	4	2	2	8	23

10 APPENDIX

Table 1: Population Growth, 2010-2017

Metro	2010 Population	2017 Population	2010-2017 Total Growth	2010-2017 % Growth
New York	19,567,410	20,320,876	753,466	3.9%
Los Angeles	12,828,837	13,353,907	525,070	4.1%
Chicago	9,461,105	9,533,040	71,935	0.8%
Dallas-Fort Worth	6,426,214	7,399,662	973,448	15.1%
Houston	5,920,416	6,892,427	972,011	16.4%
Washington DC	5,636,232	6,216,589	580,357	10.3%
Miami	5,564,635	6,158,824	594,189	10.7%
Philadelphia	5,965,343	6,096,120	130,777	2.2%
Atlanta	5,286,728	5,884,736	598,008	11.3%
Boston	4,552,402	4,836,531	284,129	6.2%
Phoenix	4,192,887	4,737,270	544,383	13.0%
San Francisco	4,335,391	4,727,357	391,966	9.0%
Riverside	4,224,851	4,580,670	355,819	8.4%
Seattle	3,439,809	3,867,046	427,237	12.4%
San Diego	3,095,313	3,337,685	242,372	7.8%
Denver	2,543,482	2,888,227	344,745	13.6%
Charlotte	2,217,012	2,525,305	308,293	13.9%
Orlando	2,134,411	2,509,831	375,420	17.6%
San Antonio	2,142,508	2,473,974	331,466	15.5%
Pittsburgh	2,356,285	2,333,367	(22,918)	-1.0%
Austin	1,716,289	2,115,827	399,538	23.3%
San Jose	1,836,911	1,998,463	161,552	8.8%
Raleigh	1,130,490	1,335,079	204,589	18.1%
Durham	504,357	567,428	63,071	12.5%
Boulder	294,567	322,514	27,947	9.5%

Source: Population Estimates, U.S. Census Bureau, 2017.

Table 2: Components of Population Change, 2010-2017

			Vital Events			Net Migration		
Metro	Total Population Change	% Population Change	Natural Increase	Deaths	Births	Total Migration	International Migration	Domestic Migration
Dallas-Fort Worth	973,448	15.1%	415,968	715,339	299,371	555,586	185,964	369,622
Houston	972,011	16.4%	436,331	703,048	266,717	533,390	260,385	273,005
New York	753,466	3.9%	776,422	1,811,927	1,035,505	-21,503	1,067,992	-1,089,495
Atlanta	598,008	11.3%	278,251	529,351	251,100	318,976	130,807	188,169
Miami	594,189	10.7%	142,462	490,495	348,033	450,144	513,783	-63,639
Washington DC	580,357	10.3%	342,413	584,628	242,215	235,768	301,884	-66,116
Phoenix	544,383	13.0%	205,702	428,751	223,049	336,896	73,046	263,850
Los Angeles	525,070	4.1%	623,365	1,202,115	578,750	-93,959	408,586	-502,545
Seattle	427,237	12.4%	160,899	333,881	172,982	266,350	141,849	124,501
Austin	399,538	23.3%	121,257	188,961	67,704	273,662	49,311	224,351
San Francisco	391,966	9.0%	162,084	377,444	215,360	230,286	210,767	19,519
Orlando	375,420	17.6%	83,072	200,843	117,771	291,358	135,860	155,498
Riverside	355,819	8.4%	234,825	442,295	207,470	122,184	43,685	78,499
Denver	344,745	13.6%	132,149	253,263	121,114	209,394	44,577	164,817
San Antonio	331,466	15.5%	119,059	236,348	117,289	210,637	40,953	169,684
Charlotte	308,293	13.9%	90,002	217,525	127,523	216,864	39,380	177,484
Boston	284,129	6.2%	116,075	374,563	258,488	171,015	226,725	-55,710
San Diego	242,372	7.8%	168,590	319,062	150,472	76,282	112,262	-35,980
Raleigh	204,589	18.1%	63,578	113,109	49,531	139,611	28,632	110,979
San Jose	161,552	8.8%	102,717	176,224	73,507	59,912	132,938	-73,026
Philadelphia	130,777	2.2%	130,620	520,600	389,980	2,901	149,902	-147,001
Chicago	71,935	0.8%	367,709	869,178	501,469	-296,320	183,162	-479,482
Durham	63,071	12.5%	20,764	47,638	26,874	39,686	16,163	23,523
Boulder	27,947	9.5%	8,936	21,163	12,227	18,871	5,562	13,309
Pittsburgh	-22,918	-1.0%	-24,100	173,472	197,572	2,903	27,300	-24,397

Source: Population Estimates, U.S. Census Bureau, 2017.
Note: Natural increase and total migration do not sum up to total population change due to statistical residuals not attributable to a component.

Table 3: Brain Gain or Drain in Tech Fields, 2012-2016

Metro	Tech Degrees 2011-2015	Tech Jobs Added 2012-2016	Brain Gain/Drain
San Fransico Bay Area	28,804	109,280	80,476
Dallas-Fort Worth	17,750	40,310	22,560
Seattle	12,043	34,260	22,217
Atlanta	22,634	43,180	20,546
Charlotte	4,639	21,690	17,051
Houston	8,578	23,320	14,742
New York	60,678	74,209	13,531
Raleigh-Durham	13,738	20,660	6,922
Austin	9,660	15,170	5,510
Chicago	36,459	40,740	4,281
Miami	9,817	13,770	3,953
San Antonio	4,005	7,480	3,475
Denver	13,918	17,370	3,452
Orlando	8,806	10,960	2,154
San Diego	12,382	14,380	1,998
Phoenix	23,969	20,870	-3,099
Philadelphia	19,891	16,550	-3,341
Pittsburgh	17,795	8,140	-9,655
Los Angeles	45,968	33,080	-12,888
Washington DC	56,623	40,270	-16,353
Boston	31,400	11,790	-19,610

Source: Scoring Tech Talent, CBRE.
Note: For this study, Durham and Raleigh are combined, as are San Francisco and San Jose. Neither Boulder nor Riverside were included in the study.

Table 4: Total Establishment Births and Deaths by Size of Business, 2014-2015

Metro	Births				Deaths				Net
	Total	<20 Employees	20-499 Employees	500+	Total	<20 Employees	20-499 Employees	500+	
Los Angeles	36,017	30,136	2,446	3,435	30,620	25,593	2,215	2,812	5,397
Miami	21,946	18,955	1,087	1,904	18,495	15,928	1,004	1,563	3,451
Dallas-Fort Worth	16,043	11,929	1,469	2,645	13,335	9,576	1,378	2,381	2,708
Houston	13,944	10,634	1,276	2,034	11,370	8,625	933	1,812	2,574
Atlanta	14,556	11,196	1,150	2,210	12,236	9,360	978	1,898	2,320
Chicago	21,796	17,361	1,348	3,087	19,640	15,316	1,350	2,974	2,156
New York	54,381	46,572	2,885	4,924	52,283	44,536	2,859	4,888	2,098
San Francisco	12,453	10,108	809	1,536	10,631	8,397	789	1,445	1,822
Seattle	9,944	7,973	635	1,336	8,170	6,633	540	997	1,774
Denver	8,754	6,865	597	1,292	7,084	5,523	494	1,067	1,670
Austin	5,641	4,222	496	923	4,170	3,134	310	726	1,471
Washington DC	14,203	10,530	1,145	2,528	12,777	9,208	871	2,698	1,426
Orlando	6,998	5,631	430	937	5,585	4,418	405	762	1,413
Riverside	7,269	5,792	540	937	5,934	4,835	483	616	1,335
San Diego	8,384	6,903	623	858	7,123	5,835	546	742	1,261
Phoenix	9,387	7,150	765	1,472	8,239	6,189	637	1,413	1,148
Charlotte	5,756	4,294	408	1,054	4,723	3,524	354	845	1,033
Boston	10,317	7,944	776	1,597	9,348	7,070	700	1,578	969
San Antonio	4,511	3,136	527	848	3,660	2,665	333	662	851
Raleigh	3,144	2,416	261	467	2,507	1,893	221	393	637
San Jose	4,844	3,947	280	617	4,266	3,399	314	553	578
Durham	1,181	900	103	178	983	705	72	206	198
Boulder	1,150	987	53	110	1,074	909	63	102	76
Philadelphia	12,374	9,490	870	2,014	12,355	9,251	846	2,258	19
Pittsburgh	4,262	2,928	388	946	4,409	3,151	367	891	-147

Source: SUSB Employment Change Data Tables, US Census Bureau.

Table 5: Rate of New Entrepreneurs Per 100,000 Adult Population, 2010-2016

Metro	Rate
Boulder	N/A
Durham	N/A
Raleigh	N/A
Los Angeles	0.56%
Miami	0.56%
Austin	0.51%
San Diego	0.49%
Atlanta	0.43%
New York	0.41%
Houston	0.40%
Denver	0.39%
Phoenix	0.38%
San Antonio	0.38%
Charlotte	0.37%
Dallas-Fort Worth	0.37%
San Francisco	0.37%
Riverside	0.36%
Boston	0.33%
Washington DC	0.28%
San Jose	0.26%
Orlando	0.25%
Seattle	0.25%
Chicago	0.22%
Philadelphia	0.21%
Pittsburgh	0.13%

Source: Kauffman Foundation
Early and broad measure of business ownership. Measures the percent of the adult population of an area that became entrepreneurs in a given month.

Table 6: Opportunity Share of New Entrepreneurs, 2010-2016

Metro	Share
Boulder	N/A
Durham	N/A
Raleigh	N/A
San Jose	90.17%
San Antonio	89.97%
Phoenix	87.15%
Dallas-Fort Worth	85.18%
Austin	84.73%
New York	84.43%
Denver	82.87%
San Diego	82.54%
Houston	81.93%
Miami	81.09%
Riverside	80.93%
Seattle	80.84%
Chicago	80.40%
Orlando	80.25%
Los Angeles	80.03%
Boston	79.85%
San Francisco	77.78%
Washington DC	76.51%
Philadelphia	75.89%
Atlanta	75.49%
Pittsburgh	71.92%
Charlotte	71.21%

Source: Kauffman Foundation
Proxy indicator of the percent of new entrepreneurs starting businesses because they saw market opportunities. Measures the percent of new entrepreneurs who were not unemployed before starting their businesses.

Table 7: Total and Per Capita R&D Expenditures at Universities and Colleges, 2016

State	2007 Expenditures (000s)	2016 Expenditures (000s)	2007-16 % Change	2016 Expenditures Per Capita	Per Capita Rank
Washington DC	$ 375,849	$ 555,721	47.9%	$ 816	1
Massachusetts	$ 2,286,853	$ 3,797,277	66.0%	$ 557	3
Pennsylvania	$ 2,501,878	$ 3,950,530	57.9%	$ 309	6
New York	$ 4,074,240	$ 6,089,673	49.5%	$ 308	7
North Carolina	$ 1,917,917	$ 2,937,671	53.2%	$ 290	9
Colorado	$ 899,200	$ 1,378,920	53.3%	$ 249	14
California	$ 6,948,312	$ 8,888,706	27.9%	$ 226	16
Washington	$ 1,023,805	$ 1,645,843	60.8%	$ 226	17
United States	$ 51,590,017	$ 71,833,308	39.2%	$ 222	
Georgia	$ 1,446,604	$ 2,179,727	50.7%	$ 211	21
Texas	$ 3,531,505	$ 5,256,599	48.8%	$ 189	28
Illinois	$ 19,70,628	$ 2,400,990	21.8%	$ 188	30
Arizona	$ 798,534	$ 1,162,283	45.6%	$ 168	37
Florida	$ 1,767,837	$ 2,527,456	43.0%	$ 123	46

Source: National Center for Science and Engineering Statistics, National Science Foundation.

Table 8a: Total and Per Capita NIH Grant Award Amount, 2017

Metro	Number of Awards	Total Award Amount	2017 Per Capita Award Amount
Boston	4,696	$ 2,503,018,132	$ 518
New York	4,399	$ 2,138,841,624	$ 105
Los Angeles	2,312	$ 1,133,518,955	$ 85
San Francisco	2,182	$ 1,096,794,154	$ 232
Washington DC	1,128	$ 1,080,850,908	$ 174
Durham	1,836	$ 979,246,934	$ 1,726
Philadelphia	2,053	$ 979,196,615	$ 161
Seattle	1,538	$ 951,599,732	$ 246
San Diego	1,665	$ 851,903,460	$ 255
Chicago	1,796	$ 730,228,788	$ 77
Houston	1,395	$ 624,703,120	$ 91
Pittsburgh	1,228	$ 574,051,807	$ 246
San Jose	1,091	$ 514,702,229	$ 258
Atlanta	965	$ 430,355,194	$ 73
Denver	723	$ 273,496,280	$ 95
Dallas-Fort Worth	572	$ 244,798,851	$ 33
Miami	494	$ 230,180,449	$ 37
Austin	290	$ 101,756,107	$ 48
Raleigh	196	$ 100,767,972	$ 75
San Antonio	245	$ 95,917,142	$ 39
Phoenix	184	$ 78,233,398	$ 17
Boulder	153	$ 47,932,320	$ 149
Riverside	98	$ 32,736,985	$ 7
Orlando	32	$ 10,354,672	$ 4
Charlotte	18	$ 6,597,744	$ 3

Source: National Institutes of Health.

Table 8b: National Institutes of Health (NIH) R&D Funding by Texas MSA, 2017

Texas Metro Area	Number of Awards	Total Award Amount	% of Total NIH funding to Texas
Austin	290	$ 101,756,107	8.8%
Dallsas-Fort Worth	572	$ 244,798,851	21.1%
Houston	1,395	$ 624,703,120	53.8%
San Antonio	245	$ 95,917,142	8.3%
Remainder of Texas	262	$ 93,469,309	8.1%

Source: National Institutes of Health.

Table 9: Total Number and Amount SBIR and STTR Grant Awards, 2008-2017

	SBIR Awards		STTR Awards		Combined Total	
State	Total Number of Awards	Total Amount of Awards ($M)	Total Number of Awards	Total Amount of Awards ($M)	Total Number of Awards	Total Amount of Awards ($M)
California	10,455	$ 4,242.0	1,192	$ 425.0	11,647	$ 4,667.0
Massachusetts	6,039	$ 2,515.6	732	$ 258.7	6,771	$ 2,774.3
New York	2,336	$ 1,001.1	321	$ 117.3	2,657	$ 1,118.4
Colorado	2,346	$ 894.1	256	$ 84.4	2,602	$ 978.5
Texas	2,143	$ 796.7	356	$ 114.8	2,499	$ 911.5
Pennsylvania	1,948	$ 799.3	270	$ 95.5	2,218	$ 894.8
North Carolina	1,040	$ 510.4	193	$ 78.2	1,233	$ 588.6
Florida	1,332	$ 513.8	202	$ 64.5	1,534	$ 578.3
Washington	1,013	$ 437.7	120	$ 46.3	1,133	$ 483.9
Illinois	1,026	$ 390.3	236	$ 77.4	1,262	$ 467.7
Arizona	892	$ 331.1	169	$ 54.8	1,061	$ 386.0
Georgia	569	$ 239.9	125	$ 55.9	694	$ 295.8
Washington DC	82	$ 26.4	14	$ 4.5	96	$ 31.0

Source: U.S. Small Business Administration.

Table 10: Venture Capital Investments and Return on Investment, 2011-2017

	2011-2017			
Metro	Total Deals	Total Dollars (B$)	Average Deal Amount (M$)	2017 Return On Investment*
San Francisco	8,356	$ 117,440	$ 14.055	4.6x
San Jose	3,532	$ 43,333	$ 12.269	4.2x
New York	4,565	$ 43,077	$ 9.436	4.8x
Boston	3,032	$ 34,924	$ 11.519	3.4x
Los Angeles	2,127	$ 24,177	$ 11.366	4.7x
Washington DC	845	$ 10,386	$ 12.292	2.9x
San Diego	812	$ 8,722	$ 10.741	3.1x
Seattle	1,060	$ 8,145	$ 7.684	5.9x
Chicago	861	$ 7,588	$ 8.813	8.5x
Austin	873	$ 6,061	$ 6.943	3.4x
Atlanta	528	$ 6,029	$ 11.418	4.4x
Philadelphia	505	$ 3,419	$ 6.770	4.7x
Miami	212	$ 3,270	$ 15.424	<2.9x
Denver	519	$ 3,220	$ 6.204	3.6x
Dallas-Fort worth	300	$ 3,124	$ 10.414	3.4x
Boulder	413	$ 2,786	$ 6.747	3.3x
Houston	213	$ 2,381	$ 11.178	<2.9x
Pittsburgh	290	$ 1,587	$ 5.472	<2.9x
Phoenix	206	$ 1,427	$ 6.926	<2.9x
Durham	178	$ 1,415	$ 7.948	<2.9x
Charlotte	88	$ 1,383	$ 15.713	<2.9x
Raleigh	121	$ 766	$ 6.334	3.2x
San Antonio	61	$ 344	$ 5.634	<2.9x
Orlando	78	$ 308	$ 3.953	<2.9x
Riverside	14	$ 22	$ 1.551	<2.9x

Source: PwC / CB Insights MoneyTree™ Report; Pitchbook.
**Note: Multiple on invested capital calculated by PitchBook as exit value/total VC raised in top metro area markets.*

Table 11: Workforce and Labor Force Participation Rate, 2016

Metro Area	Workforce	Labor Force Participation Rate
New York	10,003,260	64.8%
Los Angeles	6,645,625	64.7%
Chicago	4,926,474	67.1%
Dallas-Fort Worth	3,684,673	68.7%
Washington DC	3,313,056	71.9%
Houston	3,287,726	67.1%
Philadelphia	3,091,548	65.1%
Miami	3,056,145	62.9%
Atlanta	2,938,612	67.0%
Boston	2,648,305	69.1%
San Francisco	2,543,805	67.0%
Phoenix	2,238,744	62.1%
Seattle	2,026,228	68.0%
Riverside	1,987,395	60.2%
San Diego	1,570,422	65.1%
Denver	1,541,194	70.8%
Charlotte	1,282,614	67.2%
Orlando	1,254,827	64.2%
Pittsburgh	1,217,734	62.7%
San Antonio	1,135,725	64.1%
Austin	1,110,371	70.3%
San Jose	1,056,315	67.2%
Raleigh	679,703	69.4%
Durham	288,707	65.5%
Boulder	180,909	69.1%

Source: LAUS, Bureau of Labor Statistics; U.S. Census Bureau.

Table 12: High Tech Occupations Employment, 2018Q1

Metro	2014 Jobs	2018 Jobs	Change	% Change	2018 Total Jobs	% of Total Employment
New York	449,257	477,955	28,698	6.0%	10,261,714	4.7%
Washington DC	327,587	344,631	17,044	5.0%	3,503,690	9.8%
Los Angeles	319,041	334,866	15,825	5.0%	6,891,586	4.9%
San Francisco	216,591	260,006	43,415	20.0%	2,711,733	9.6%
Chicago	241,582	253,827	12,245	5.0%	4,903,611	5.2%
Boston	229,868	250,437	20,569	9.0%	2,955,136	8.5%
Dallas-Fort Worth	211,471	232,300	20,829	10.0%	3,886,702	6.0%
San Jose	201,377	230,485	29,108	14.0%	1,210,020	19.0%
Seattle	196,702	218,732	22,030	11.0%	2,212,652	9.9%
Houston	206,066	198,739	-7,327	-4.0%	3,298,735	6.0%
Atlanta	163,312	179,774	16,462	10.0%	2,865,445	6.3%
Philadelphia	166,575	170,281	3,706	2.0%	3,057,592	5.6%
Phoenix	120,260	133,096	12,836	11.0%	2,208,918	6.0%
Denver	113,125	126,706	13,581	12.0%	1,630,009	7.8%
San Diego	113,256	120,477	7,221	6.0%	1,724,211	7.0%
Austin	85,668	97,437	11,769	14.0%	1,115,083	8.7%
Miami	83,888	94,371	10,483	12.0%	2,886,153	3.3%
Charlotte	59,929	71,648	11,719	20.0%	1,290,151	5.6%
Pittsburgh	68,086	71,249	3,163	5.0%	1,215,759	5.9%
Raleigh	53,397	61,697	8,300	16.0%	674,617	9.1%
Orlando	47,476	55,456	7,980	17.0%	1,321,178	4.2%
San Antonio	43,741	46,957	3,216	7.0%	1,161,388	4.0%
Riverside	38,353	40,708	2,355	6.0%	1,675,732	2.4%
Durham	31,342	33,325	1,983	6.0%	337,392	9.9%
Boulder	26,888	28,353	1,465	5.0%	207,875	13.6%

Source: EMSI, Regional Comparison by Occupation.

Table 13: STEM Occupation Employment, 2018Q1

Metro	2014 Jobs	2018 Jobs	Change	% Change	2018 Total Jobs	% of Total Employment
New York	347,475	369,043	21,568	6.0%	10,261,714	3.6%
Washington DC	254,635	267,058	12,423	5.0%	3,503,690	7.6%
Los Angeles	252,535	263,835	11,300	4.0%	6,891,586	3.8%
San Francisco	172,666	205,129	32,463	19.0%	2,711,733	7.6%
Boston	183,465	199,508	16,043	9.0%	2,955,136	6.8%
Chicago	177,405	184,891	7,486	4.0%	4,903,611	3.8%
San Jose	158,065	180,246	22,181	14.0%	1,210,020	14.9%
Seattle	159,596	175,418	15,822	10.0%	2,212,652	7.9%
Dallas-Fort Worth	159,267	174,162	14,895	9.0%	3,886,702	4.5%
Houston	173,189	165,549	-7,640	-4.0%	3,298,735	5.0%
Philadelphia	131,470	133,826	2,356	2.0%	3,057,592	4.4%
Atlanta	114,482	126,153	11,671	10.0%	2,865,445	4.4%
San Diego	94,593	100,312	5,719	6.0%	1,724,211	5.8%
Phoenix	90,756	99,631	8,875	10.0%	2,208,918	4.5%
Denver	86,918	96,748	9,830	11.0%	1,630,009	5.9%
Austin	66,954	75,572	8,618	13.0%	1,115,083	6.8%
Miami	60,478	68,434	7,956	13.0%	2,886,153	2.4%
Pittsburgh	53,713	55,777	2,064	4.0%	1,215,759	4.6%
Charlotte	43,872	52,128	8,256	19.0%	1,290,151	4.0%
Raleigh	41,385	47,847	6,462	16.0%	674,617	7.1%
Orlando	33,820	39,788	5,968	18.0%	1,321,178	3.0%
San Antonio	32,354	34,500	2,146	7.0%	1,161,388	3.0%
Riverside	31,892	33,785	1,893	6.0%	1,675,732	2.0%
Durham	25,062	26,686	1,624	6.0%	337,392	7.9%
Boulder	21,651	22,769	1,118	5.0%	207,875	11.0%

Source: EMSI, Regional Comparison by Occupation 2018Q1.

Table 14: Creative Industry Employment and Establishments, 2018Q1

Metro	2014 Jobs	2018 Jobs	Change	% Change	2018 Total Jobs	% of Total Employment
New York	449,231	477,679	28,448	6.0%	10,261,714	4.7%
Los Angeles	349,695	382,839	33,144	9.0%	6,891,586	5.6%
Chicago	122,535	129,736	7,201	6.0%	4,903,611	2.6%
San Francisco	103,583	120,667	17,084	16.0%	2,711,733	4.4%
Washington DC	83,835	84,893	1,058	1.0%	3,503,690	2.4%
Boston	79,377	82,464	3,087	4.0%	2,955,136	2.8%
Atlanta	69,123	81,847	12,724	18.0%	2,865,445	2.9%
Dallas-Fort Worth	73,787	76,099	2,312	3.0%	3,886,702	2.0%
Miami	63,329	67,399	4,070	6.0%	2,886,153	2.3%
San Jose	51,948	65,602	13,654	26.0%	1,210,020	5.4%
Seattle	53,739	63,978	10,239	19.0%	2,212,652	2.9%
Philadelphia	60,032	61,232	1,200	2.0%	3,057,592	2.0%
Houston	44,984	47,313	2,329	5.0%	3,298,735	1.4%
Phoenix	39,481	42,411	2,930	7.0%	2,208,918	1.9%
Denver	38,297	40,861	2,564	7.0%	1,630,009	2.5%
San Diego	36,406	36,047	-359	-1.0%	1,724,211	2.1%
Austin	26,457	31,685	5,228	20.0%	1,115,083	2.8%
Orlando	23,503	26,732	3,229	14.0%	1,321,178	2.0%
Pittsburgh	24,034	23,932	-102	0.0%	1,215,759	2.0%
Charlotte	21,505	23,679	2,174	10.0%	1,290,151	1.8%
Riverside	21,458	22,507	1,049	5.0%	1,675,732	1.3%
San Antonio	18,668	18,032	-636	-3.0%	1,161,388	1.6%
Raleigh	11,205	13,158	1,953	17.0%	674,617	2.0%
Boulder	6,203	7,190	987	16.0%	207,875	3.5%
Durham	5,753	6,414	661	11.0%	337,392	1.9%

Source: EMSI, Industry Table 2018Q1; UNT, "The Economic Impacts of the Dallas-Ft. Worth Creative Economy", July 2016.

Table 15: Gross Metro Product, 2007-2016

Metro	2007	2016	2007-2016 % Change in GMP	2016 Per Capita GMP	% Contibuted to US GDP by Metro
New York	$1,311,379	$1,426,027	8.7%	$ 70,758	9.6%
Los Angeles	$781,892	$884,836	13.2%	$ 66,477	6.0%
Chicago	$553,376	$568,969	2.8%	$ 59,810	3.8%
Dallas	$361,754	$471,278	30.3%	$ 65,154	3.2%
Washington	$405,117	$449,293	10.9%	$ 73,270	3.0%
Houston	$376,961	$442,458	17.4%	$ 65,332	3.0%
Philadelphia	$341,433	$381,332	11.7%	$ 62,817	2.6%
Boston	$320,201	$371,577	16.0%	$ 77,502	2.5%
Atlanta	$290,819	$320,171	10.1%	$ 55,300	2.2%
Miami	$277,817	$287,775	3.6%	$ 47,438	1.9%

Source: Bureau of Economic Analysis.
Note: Real GMP (millions of chainded 2009 dollars).

Table 16: Employment Growth, 2012-2016

Metro	2012 Annual Employment	2016 Annual Employment	2012-16 Change	2012-16 Percent Change	Unemployment Annual 2016
Atlanta	2,545,474	2,788,476	243,002	9.5%	5.1
Austin	931,584	1,074,349	142,765	15.3%	3.2
Boston	2,397,441	2,559,413	161,972	6.8%	3.4
Boulder	163,471	176,017	12,546	7.7%	2.7
Charlotte	1,065,187	1,221,702	156,515	14.7%	4.7
Chicago	4,438,860	4,639,860	201,000	4.5%	5.8
Dallas-Fort Worth	3,195,172	3,542,855	347,683	10.9%	3.8
Denver	1,336,233	1,493,040	156,807	11.7%	3.1
Durham	2,50,873	275,813	24,940	9.9%	4.5
Houston	2,906,813	3,115,186	208,373	7.2%	5.2
Los Angeles	5,817,662	6,316,785	499,123	8.6%	4.9
Miami	2,667,713	2,903,182	235,469	8.8%	5.0
New York	9,050,358	9,523,594	473,236	5.2%	4.8
Orlando	1,064,895	1,198,070	133,175	12.5%	4.5
Philadelphia	2,792,071	2,934,123	142,052	5.1%	5.1
Phoenix	1,893,342	2,136,132	242,790	12.8%	4.6
Pittsburgh	1,138,780	1,148,474	9,694	0.9%	5.7
Raleigh	568,545	650,277	81,732	14.4%	4.3
Riverside	1,662,671	1,870,214	207,543	12.5%	5.9
San Antonio	987,374	1,093,136	105,762	10.7%	3.7
San Diego	1,399,879	1,496,954	97,075	6.9%	4.7
San Francisco	2,205,839	2,447,427	241,588	11.0%	3.8
San Jose	907,918	1,015,679	107,761	11.9%	3.8
Seattle	1,759,347	1,935,205	175,858	10.0%	4.5
Washington DC	3,047,895	3,186,597	138,702	4.6%	3.8

Source: LAUS, Bureau of Labor Statistics.

NOTES

To learn more about the Dallas Regional Chamber's Innovation Study please contact Duane Dankesreiter, Senior Vice President of Research and Innovation at 214.746.6600, or ddankesreiter@dallaschamber.org.

Special thanks to our partner in innovation, Accenture, who provided assistance with research and production of the Dallas-Fort Worth Innovation Scorecard. In 2018, we'll continue to work with Accenture and community partners on a deeper analysis of what the future of innovation looks like in our region and how we can accelerate it together.

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Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Combining unmatched experience and specialised skills across more than 40 industries and all business functions—underpinned by the world's largest delivery network—Accenture works at the intersection of business and technology to help clients improve their performance and create sustainable value for their stakeholders. With more than 435,000 people serving clients in more than 120 countries, Accenture drives innovation to improve the way the world works and lives. Visit us at www.accenture.com.

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