

At the Heart of Texas:

Overview

With five metropolitan areas of 2 million or more residents, Texas has more big cities per capita than most large U.S. states.¹ Dallas–Fort Worth and Houston rank among the top six largest metropolitan areas in the U.S. in terms of both population and economic output. In fact, Texas is the only state to have two metros in the top 10 for both measures.

The abundance of large cities is an important growth advantage on the state’s list of favorable economic factors: central location, rich oil and gas deposits, well-placed sea and land ports, proximity to Mexico, rapid population growth, low cost of living and relatively light regulatory burden. Thus, it is no surprise that employment has grown a percentage point faster in Texas than in the nation on average and that state gross domestic product growth was nearly twice that of the nation during the economic recovery following the Great Recession.²

Amid this economic expansion and a near 40-year low in unemployment, this second edition of *At the Heart of Texas*, a special report on the historical, economic and demographic profiles of Texas and its key metropolitan areas, builds upon the first edition released in February 2016.

Four smaller Texas metros are new to this edition—Amarillo, Beaumont–Port Arthur, Lubbock and Tyler–Longview. Collectively, they highlight the economic contributions of smaller cities and more rural areas, as well as the importance within the state of certain industries, including agriculture and refining and petrochemicals.

This edition also moves forward the time period under study, focusing on economic developments within Texas and its metros in the 2010–17 post-Great Recession period—a stretch that includes the fracking boom but also the 2015–16 energy bust, which slowed the state’s economic expansion relative to its nonenergy peers. As the state economy slowed notably in 2015–16 due to collapsing oil prices and related exploration activities, metros such as Dallas and Austin with a more diversified industrial base offset weakness in Houston, Midland–Odessa and other energy-producing regions.

Importance of Cities

It is the age of the city. Paradoxically, as globalization put everything and everywhere seemingly within reach, attention has been drawn from national boundaries to these smaller units of civilization. This is not new when taking a longer perspective; after all, cities have been the rock stars of history before, whether it’s Babylon, the cradle of civilization; Athens, the birthplace of democracy; Florence, the origin of the Renaissance; or Birmingham, home of the Industrial Revolution.

Cities were centers of population, commerce, learning, wealth and economic opportunity long before economists explained why agglomeration matters to growth.

Cities are dense areas, with relatively high productivity and wages compared with noncities. The productivity advantage stems from agglomeration, which means firms that co-locate have ready access to a deep labor pool, the easy exchange of ideas and low transportation costs.³ When firms in like industries cluster, they can further leverage the benefits of agglomeration. Examples are Silicon Valley, de facto headquarters of the U.S. high-tech industry, and Houston, home to the bulk of the nation’s oil and gas sector. Harvard economist Ed Glaeser calls cities “mankind’s greatest invention” and argues in a 2011 book that cities have led human progress through the ages by acting as engines of innovation.⁴

Dominant Clusters Power Texas

Characteristics such as location, natural resources and labor force contribute to an area’s long-run economic performance. Industry mix and industry agglomeration are additional important factors. Geographically, groups of firms are concentrated based on the technologies they employ, the markets they serve, the goods and services they produce and the labor skills they require. Such industry clusters are important because they provide their participants (firms) with access to specialized knowledge and/or resources, enhancing

productivity, spurring innovation and attracting new business and investment in the area.⁵

An area typically has an economic base that consists of several dominant industry clusters. These clusters typically exceed the national average in their share of employment, output or earnings. Location quotients (LQs), which compare the relative concentration of industry clusters locally and nationally, are one way of assessing these key drivers in an area’s economy. An LQ exceeding 1 indicates that a specific industry cluster is more dominant locally than nationally. In this report, LQs are calculated using industry cluster employment, and industry cluster growth is measured by the percentage-point change in its share of local employment between 2010 and 2017.⁶

The presentation here uses annual employment data from the Quarterly Census of Employment and Wages to compute location quotients. These data are readily available at the metropolitan statistical area (MSA) level and by three-digit-or-higher North American Industry Classification System (NAICS) code, facilitating analysis. Industry cluster definitions are taken from Stats America, with some modifications that are detailed in the appendix. Clusters generally comprise multiple interdependent or interrelated industries or

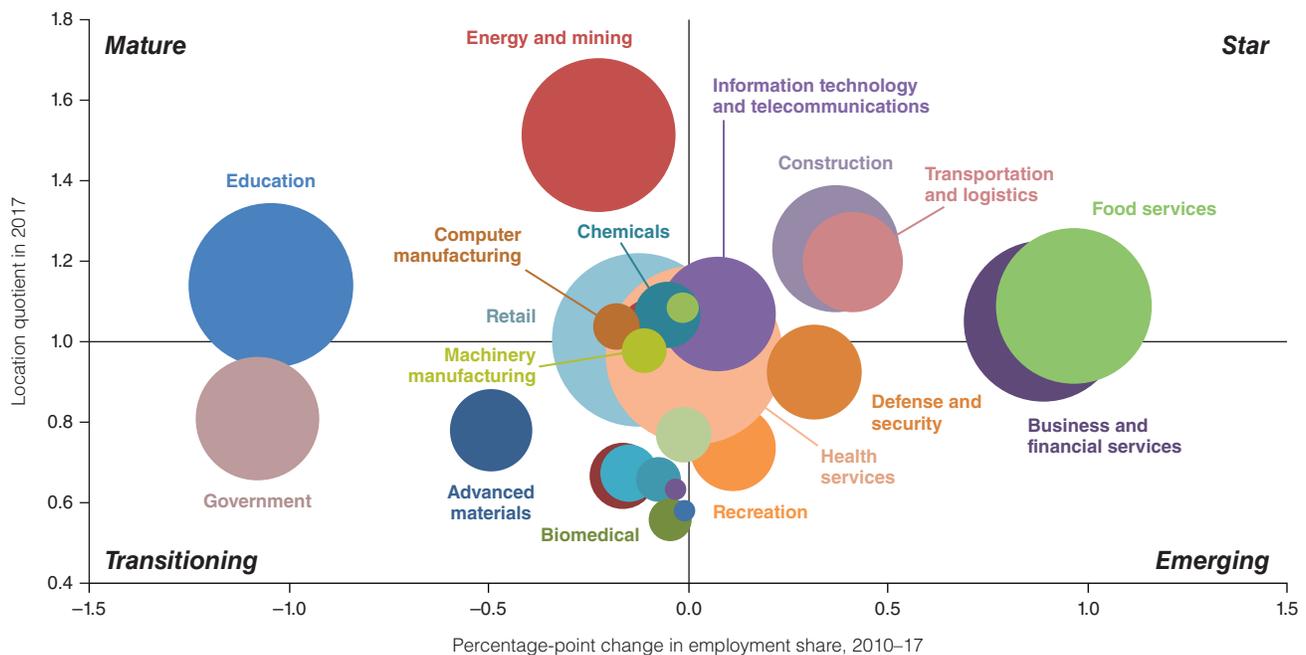
NAICS classifications. The entertainment cluster in Los Angeles and the auto manufacturing cluster in Detroit are examples of such broad groupings that include the main industry and its suppliers and service providers.

Chart 1.1 plots industry cluster LQs and growth for Texas. Clusters in the top half of the chart, such as energy and mining, information technology, business and financial services, construction, and transportation and logistics, are referred to as base clusters. They have a larger share of state employment relative to the nation and, thus, an LQ exceeding 1. A base cluster is usually vital to an area’s economy and can be expanding relatively rapidly (star) or growing slowly or declining (mature).

Those in the bottom half are less-dominant locally than nationally. They generally produce services or goods for local consumption and, hence, have an LQ below 1. “Emerging” clusters, such as defense and security, are relatively fast growing, while those growing slowly or declining are termed “transitioning.”

Education and health services clusters combine public and private sector employment. Thus, apart from the government cluster, all others comprise only private sector employment.

Chart 1.1: Energy, IT and Business and Financial Services Help Set Texas Apart from Nation



NOTE: Bubble size represents cluster share of metropolitan statistical area employment.
 SOURCES: Texas Workforce Commission; Bureau of Labor Statistics.

Texas' Leading Clusters

Texas has several dominant clusters. An abundance of oil and gas has traditionally made energy-related industries a major cluster—it employs 8.6 percent of the state's workforce and has an LQ of 1.5. Texas' geological makeup includes four shale formations—the Permian Basin, Barnett, Haynesville and Eagle Ford—helping make the state the No. 1 producer of oil and gas in the nation. Texas produces 39 percent of all U.S. crude oil and 23 percent of U.S. natural gas and employs 12.6 percent of the workers in the nation's energy and mining cluster. The employment share of the cluster was little changed from 2010 to 2017, with the head count rising 15 percent (*Chart 1.2*). The slower growth relative to other sectors is due to the time period, which included both the ongoing shale oil boom and 2015–16 energy bust.

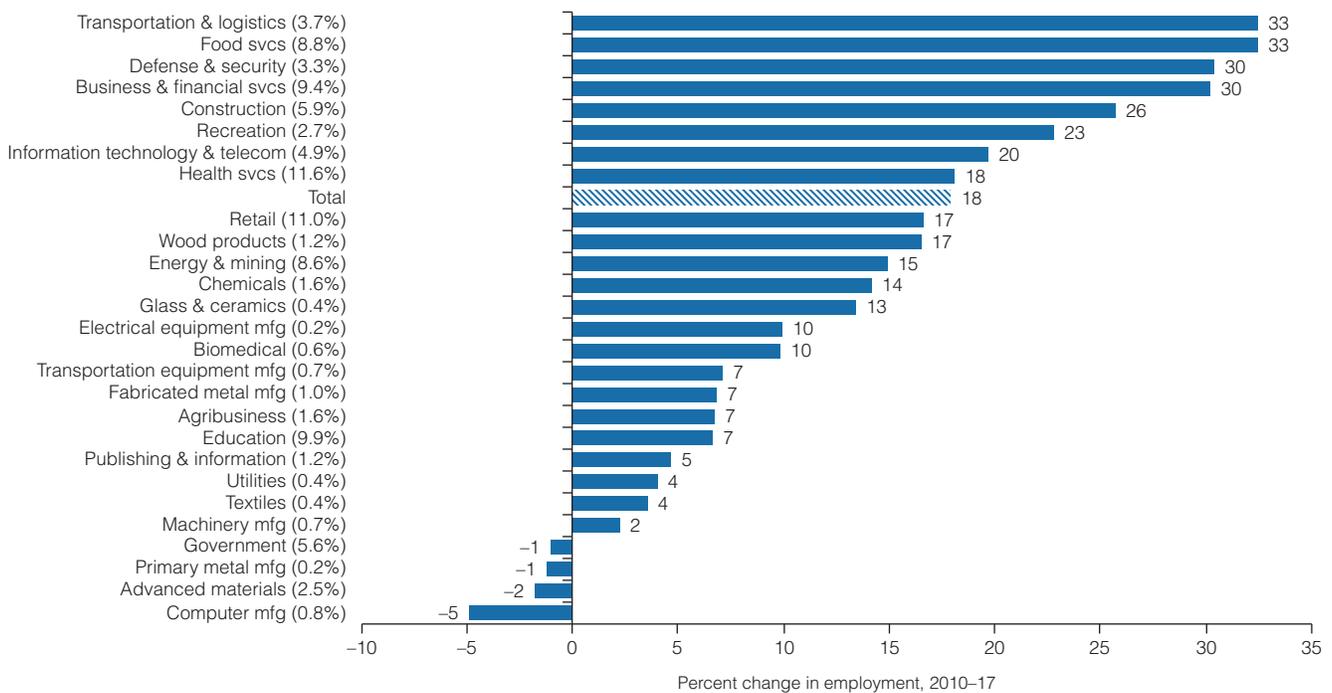
Employment in construction (LQ of 1.2 in 2017) grew rapidly over the period, supported by the energy sector and overall strong economic performance that increased demand for office, industrial and residential space. The downstream energy sector also plays a meaningful role in Texas, which isn't surprising given

the significant presence of refineries and petrochemical plants near the Gulf Coast.

Texas has evolved into a major high-tech hub (LQ of 1.1 in 2017). The industry took off after World War II, as Dallas-based Texas Instruments and other military-electronics manufacturers branched into civil electronics. Texas also flourished during the 1990s high-tech boom, when the IT and telecommunications industries expanded in Austin and Dallas. Employment in the IT and telecom cluster grew about 20 percent in 2010–17 and now represents 5 percent of the state's workforce. Employment in defense and security, with complementary ties to the state's high-tech and energy sectors, also rapidly expanded, rising 30 percent during the period.

Additionally, Texas' central U.S. location and its border with Mexico have boosted the concentration of the transportation and logistics industry (LQ of 1.2). Texas is the largest exporting state in the nation, and it is home to two large commercial airlines, a major railroad and two of the nation's busiest ports—Houston, a seaport, and Laredo, an inland port of entry. Education,

Chart 1.2: Defense and Business Services Among State's Fastest-Growing Clusters



NOTES: Percent change in employment is shown in whole numbers. Each cluster's share of total jobs is shown in parentheses (rounded to one decimal place). SOURCES: Texas Workforce Commission; authors' calculations.

Table 1.1: Most Dominant Clusters Pay Better in Texas than in U.S.

Cluster	Texas					U.S.
	2010	2012	2014	2016	2017	2017
Energy and mining	92,568	96,000	96,769	95,219	94,459	80,900
Construction	55,346	57,915	60,684	63,024	63,224	60,742
Transportation and logistics	59,586	62,194	61,913	60,621	60,887	53,761
Education	43,879	42,411	43,504	45,093	45,144	49,322
Utilities	101,073	105,494	103,939	107,291	111,503	107,188
Food services	17,757	17,658	17,798	18,533	18,655	18,963
Glass and ceramics	51,499	53,930	57,653	58,283	60,338	55,398
Information technology and telecommunications	93,485	95,293	95,717	99,732	101,583	106,629
Chemicals	80,600	83,663	85,827	86,810	88,128	72,887
Business and financial services	86,153	87,672	90,182	92,106	92,445	100,785
Fabricated metal manufacturing	58,593	60,538	61,305	60,056	60,736	55,830
Computer manufacturing	111,364	114,313	114,392	123,805	130,458	120,226
Retail	30,496	30,776	31,075	31,531	31,591	31,216
Clusters with location quotient > 1	60,615	66,501	67,712	61,527	61,858	–
Clusters with location quotient < 1	56,206	50,620	51,267	60,812	61,243	–
Average earnings (total)	52,779	53,998	55,102	55,490	55,800	55,375

NOTES: Clusters are listed in order of location quotient (LQ); clusters shown are those with LQs greater than 1. Earnings are in 2017 dollars.
 SOURCES: Texas Workforce Commission; Bureau of Labor Statistics; authors' calculations.

which includes elementary and secondary schools, also has a slightly higher-than-average presence in the state, likely due to a younger population.

Several of Texas' dominant clusters, such as energy and mining, computer manufacturing, chemicals, and IT and telecommunications boast high pay (*Table 1.1*). In fact, the average pay of workers in most clusters with an LQ greater than 1 exceeds the comparable U.S. figure. Earnings in dominant clusters are also 11 percent more than the overall average for the state (\$55,800).

The Texas earnings premium in dominant industry clusters is consistent with theory. Productivity should be higher in dominant industries for the reasons previously noted, such as demand for workers' specialized skill sets; hence, employers should pay an earnings premium over the same industry cluster in locations where the cluster is not dominant. While the data for the state mostly bear this out, it isn't always the case for the metros. Industry earnings at the metro level reflect myriad local considerations that distort comparisons

with the nation, including cost of living and workforce demographics and skill levels.

Popular Migrant Destination

Migration has played an important role in sustaining the state's long-term economic growth premium. Nearly half of workers in the state are not native Texans. Since 2000, population gains from net migration (domestic and international) and natural increase (births minus deaths) have been roughly equal (*Chart 1.3*).⁷

Texas was among the first states to bounce back from the Great Recession, and its booming economy attracted many workers, particularly from other parts of the U.S. where growth was still languishing. In fact, Texas was the second-largest net recipient of domestic migrants (after Florida) among the 50 states from July 2010 to July 2017, receiving 916,000 people—3.6 percent of the state's 2010 population. Domestic migrants to Texas come from a variety of states, with transplants from

California accounting for the largest share during this period. Arrivals from other countries also contributed strongly to the state’s population growth during the period, with immigrants from Mexico making up the largest share of inflows. Texas was the recipient of 658,000 net international migrants from 2010 to 2017, amounting to 2.6 percent of its 2010 population.⁸

The migrant inflow propelled the state’s population growth rate to more than double that of the U.S. Texas is younger and boasts a larger share of foreign born relative to the rest of the nation.

Texas Again Outperforms Nation; More Growth Likely

With the last plunge in oil prices, the economic landscape in the region changed, and employment growth slowed to 1.2 percent. Payroll employment in energy-dependent metros such as Houston and Midland–Odessa was flat or declined during the downturn. With a strong rebound in 2017, activity in the state’s energy and

manufacturing sectors came roaring back. Texas was the nation’s ninth-fastest-growing economy in 2017.

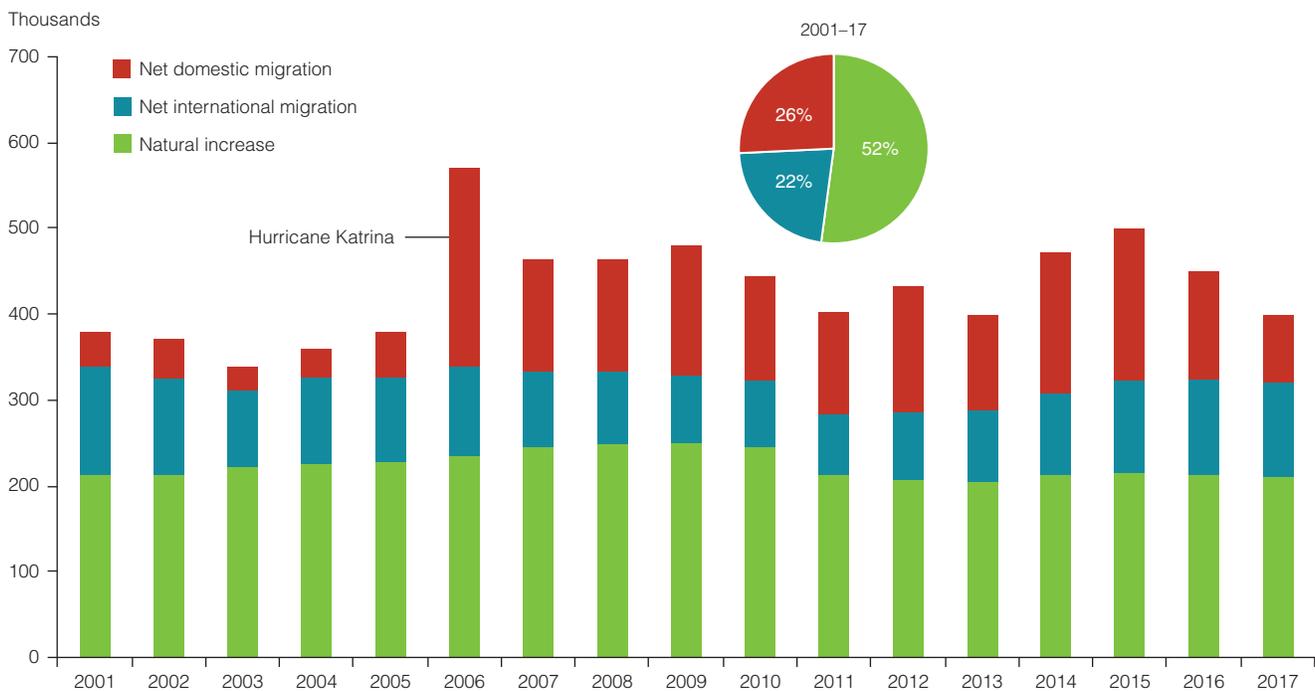
The Texas expansion has continued into 2018. Annualized job growth in the first nine months of 2018 was a robust 2.4 percent—well ahead of the nation’s 1.7 percent annualized increase. Areas of the state tied to oil and gas have grown at their strongest pace since 2014. The construction sector remains solid, the service sector is experiencing widespread expansion and manufacturing activity is near multiyear highs.

With this strength, the Federal Reserve Bank of Dallas projects employment growth around 2.4 percent for 2018, well above the state’s long-term average of 2 percent. A tight labor market threatens to constrain future growth, however.

Federal tax law changes that took effect in 2018 will likely benefit Texas, while tariffs and uncertainty regarding future U.S. and world trade policies could cool activity and investment plans and, ultimately, economic growth.

This decade on the whole has been good for Texas and its metros despite the two-year energy bust. From

Chart 1.3: Migration, Natural Increase Contribute Equally to Texas Population Growth



NOTE: Census Bureau estimates approximate the population on July 1 of the year indicated and, thus, capture changes from the previous year.

SOURCE: Census Bureau.

December 2010 to December 2017, Texas on average grew faster than the nation, with job gains in the state averaging 2.4 percent per year, compared with 1.7 percent for the nation. Texas output expanded at nearly twice the U.S. pace from 2010 to 2017.

New to the Second Edition

This edition has an expanded geographical breadth, revises some cluster definitions for improved clarity and updates economic analyses.

Modifications to the cluster methodology, used to determine key sectors within metros, are explained in detail in the appendix. Among the changes, the government sector covers only employment within local, state and federal governments and excludes publicly funded health care and education. Food services employment, previously included in the recreation cluster, is now its own cluster.

While such an aggregate view tells part of the story, the industry clusters of each area define a metro's distinctive place in the state's economy and explain how its individual metros contribute to Texas job growth and income gains. Conversely, the state as a whole provides useful context with which to examine the individual metros.

Notes

¹ Among large states, only Ohio and Pennsylvania have more big cities per capita. Big cities refer to metropolitan statistical areas or metro divisions of over 2 million residents in 2017.

² Texas job growth averaged 2.0 percent per year, compared with 1.1 percent for the nation during 1990–2017. Inflation-adjusted state gross domestic product growth averaged 3.5 percent per year, compared with 1.9 percent for the U.S. during 2010–17.

³ "The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States," by Edward L. Glaeser and Joshua D. Gottlieb, National Bureau of Economic Research, NBER Working Paper no. 14806, March 2009.

⁴ *Triumph of the City: How Our Greatest Invention Makes Us Richer, Smarter, Greener, Healthier, and Happier*, by Edward L. Glaeser, New York: Penguin Press, 2011.

⁵ For more information on what clusters are and how they affect competition and innovation, see "Location, Competition and Economic Development: Local Clusters in a Global Economy," by Michael E. Porter, *Economic Development Quarterly*, vol. 14, February 2000, pp. 15–34. Also, see "Clusters, Convergence, and Economic Performance," by Mercedes Delgado, Michael Porter and Scott Stern, National Bureau of Economic Research, NBER Working Paper no. 18250, July 2012.

⁶ Individual industry cluster shares do not add to 100 because some smaller industries at the three-digit-or-higher level in the North American Industry Classification System (NAICS) are included in multiple clusters, while some industries are not part of any of the clusters shown. Clusters include other related industries. For instance, semiconductor manufacturing (NAICS 3344) is included in both the advanced materials and information technology and telecommunications clusters.

⁷ "Gone to Texas: Migration Vital to Growth in the Lone Star State," by Pia Orrenius, Alexander T. Abraham and Stephanie Gullo, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter 2018.

⁸ Data are from the Census Bureau.