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At the Heart of Texas:
Cities' Industry Clusters Drive Growth

Dallas Fed Special Report | Second Edition

Pia Orrenius, Laila Assanie and Michael Weiss

Laila Assanie
Dallas Fed
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The views expressed are my own and do not necessarily reflect official positions of the Federal Reserve System.

Overview

- Texas economic activity is concentrated in the eight key metros:
    - Austin, Dallas, El Paso, Fort Worth, Houston, McAllen, Midland-Odessa and San Antonio
- Smaller metros are new to the second edition and are part of the larger Texas mosaic:
    - Amarillo, Beaumont-Port Arthur, Lubbock, Tyler and Longview
- Commercial make-up of each metro is unique and shaped in part by its history, geography, geology and demography
- Industrial composition drives economic expansion

It's the Age of the City

- Cities have been centers of population, commerce, learning and economic opportunity over the long term
- Movement toward urbanization since the Industrial Revolution
- Cities enjoy higher productivity and wages than non-cities
- "Mankind's greatest invention"--- Harvard economist Ed Glaeser

Texas Advantages

- Texas benefits from an outsized number of metros with 2 million or more residents
- Dallas–Fort Worth and Houston rank among the top six largest U.S. metro areas in population and economic output
- Other favorable economic factors
  - Central location, oil and gas deposits, land and seaports, proximity to Mexico, young and fast growing population, low cost of living and doing business

Employment Growth in Large Texas Metros Outpaces Small Ones
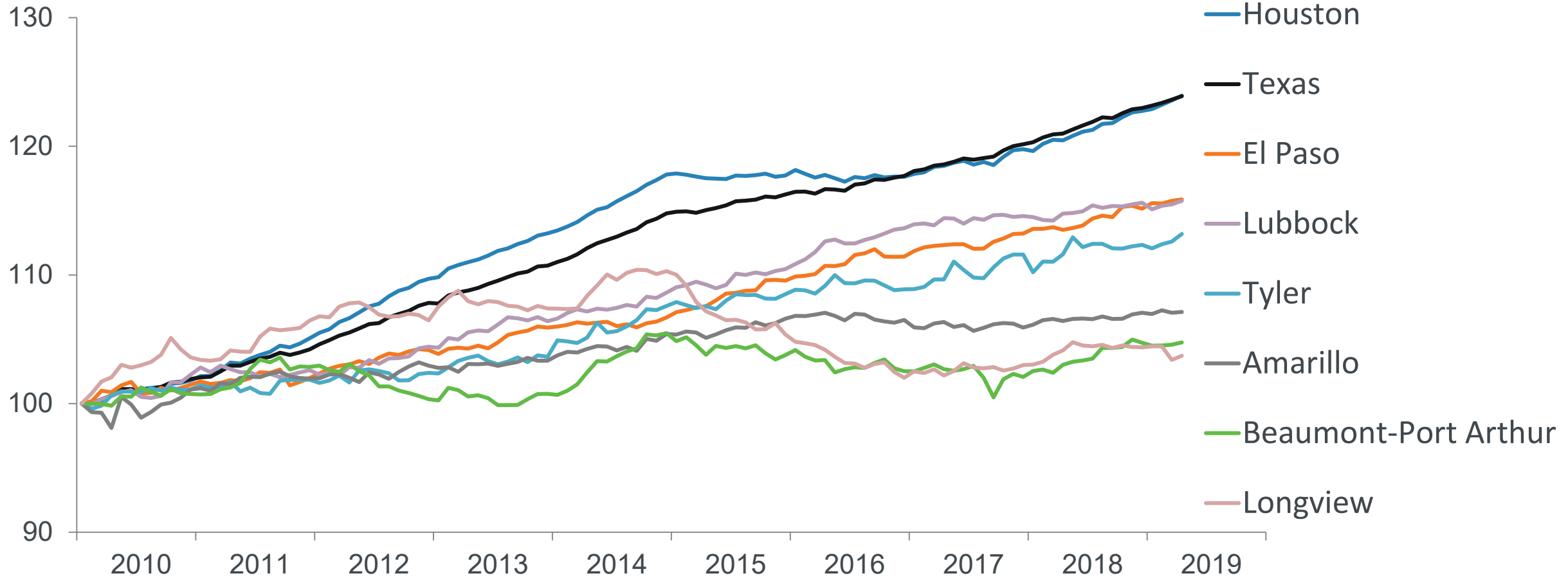
Index, Jan. 2010=100
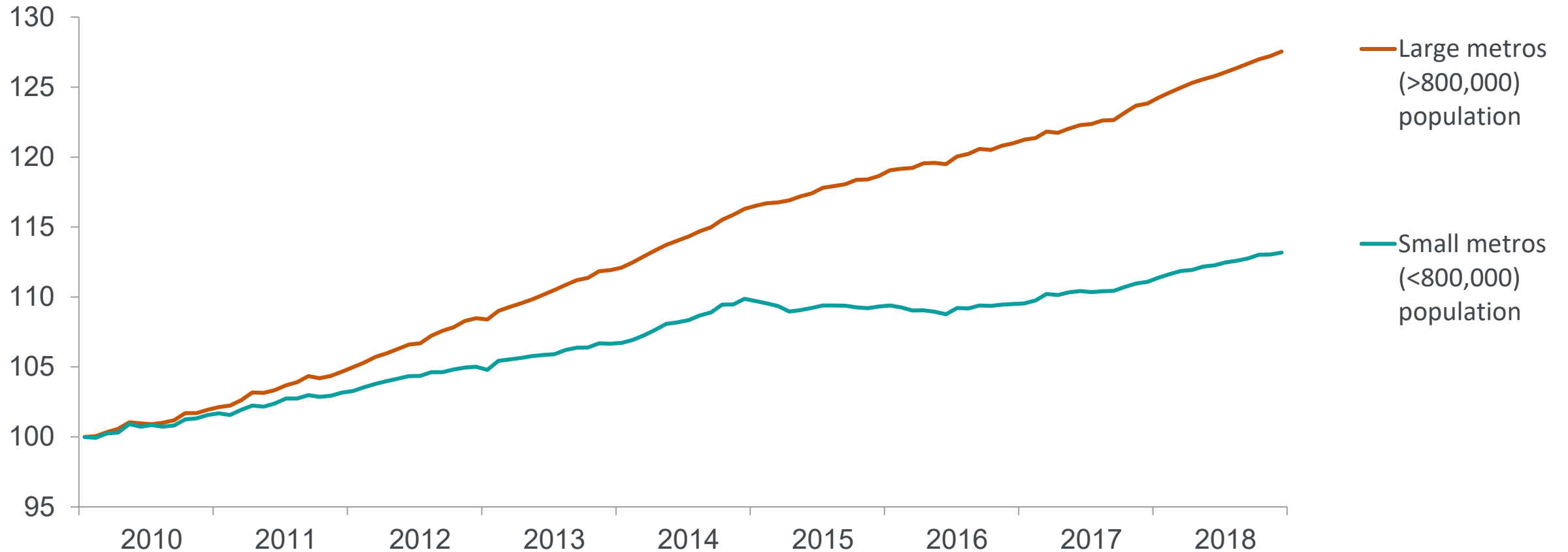
NOTES: Employment data are seasonally adjusted. Small and large metros are aggregated based on 2017 population above or below 800,000.
SOURCES: Bureau of Labor Statistics; Texas Workforce Commission.

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Modest Job Gains in Small Metros

Index, Jan. 2010=100, SA

Houston
Texas
El Paso
Lubbock
Tyler
Amarillo
Beaumont-Port Arthur
Longview

SOURCES: Texas Workforce Commission; Federal Reserve Bank of Dallas.

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Unemployment in Most Metros Below Texas Rate

SOURCES: Bureau of Labor Statistics; seasonal and other adjustments by Federal Reserve Bank of Dallas.

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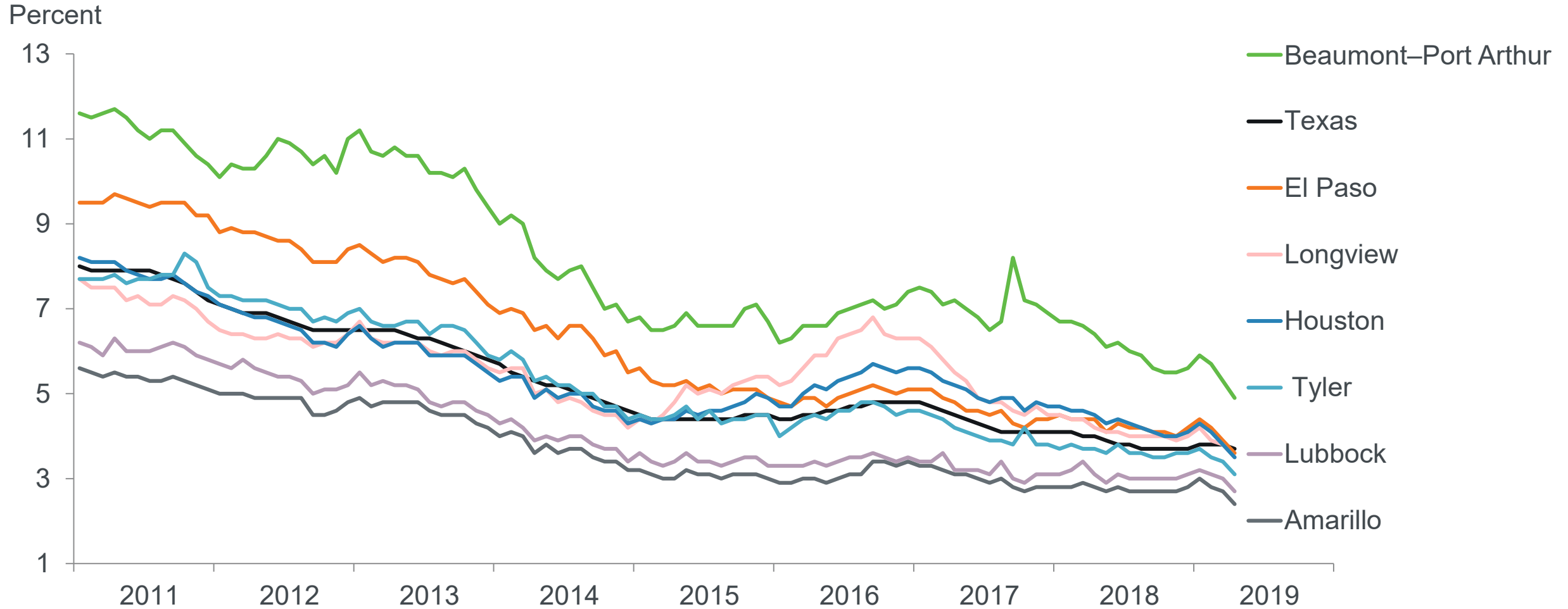
Industry Clusters

- Cluster formation is driven by:
  - Geographical concentration, technology relationships
  - Markets
  - Goods and services produced
  - Labor skills
- Clusters comprise of multiple interdependent or interrelated industries

Measuring Cluster Concentration

- Location Quotient (LQ):

$$\frac{Share\ of\ metro\ area\ employment\ in\ industry\ i}{Share\ of\ U.S.employment\ in\ industry\ i}$$

- LQ >1 → Clustering or specialization

- LQ <1 → No specialization

- Period measured: 2010-2018

- Clusters increase productivity, stimulate innovation and facilitate new business formation
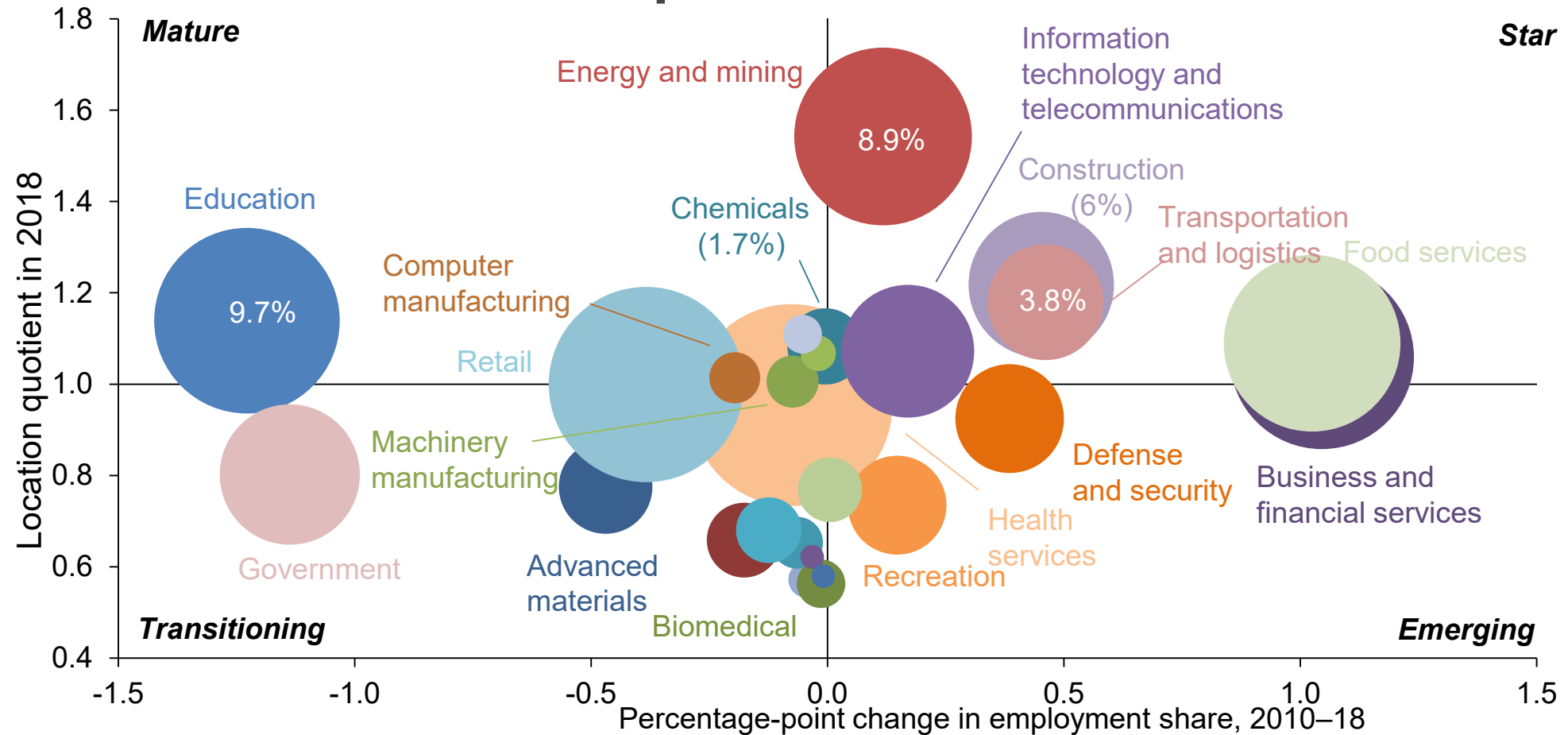
- Higher productivity leads to higher wages

Texas Overview
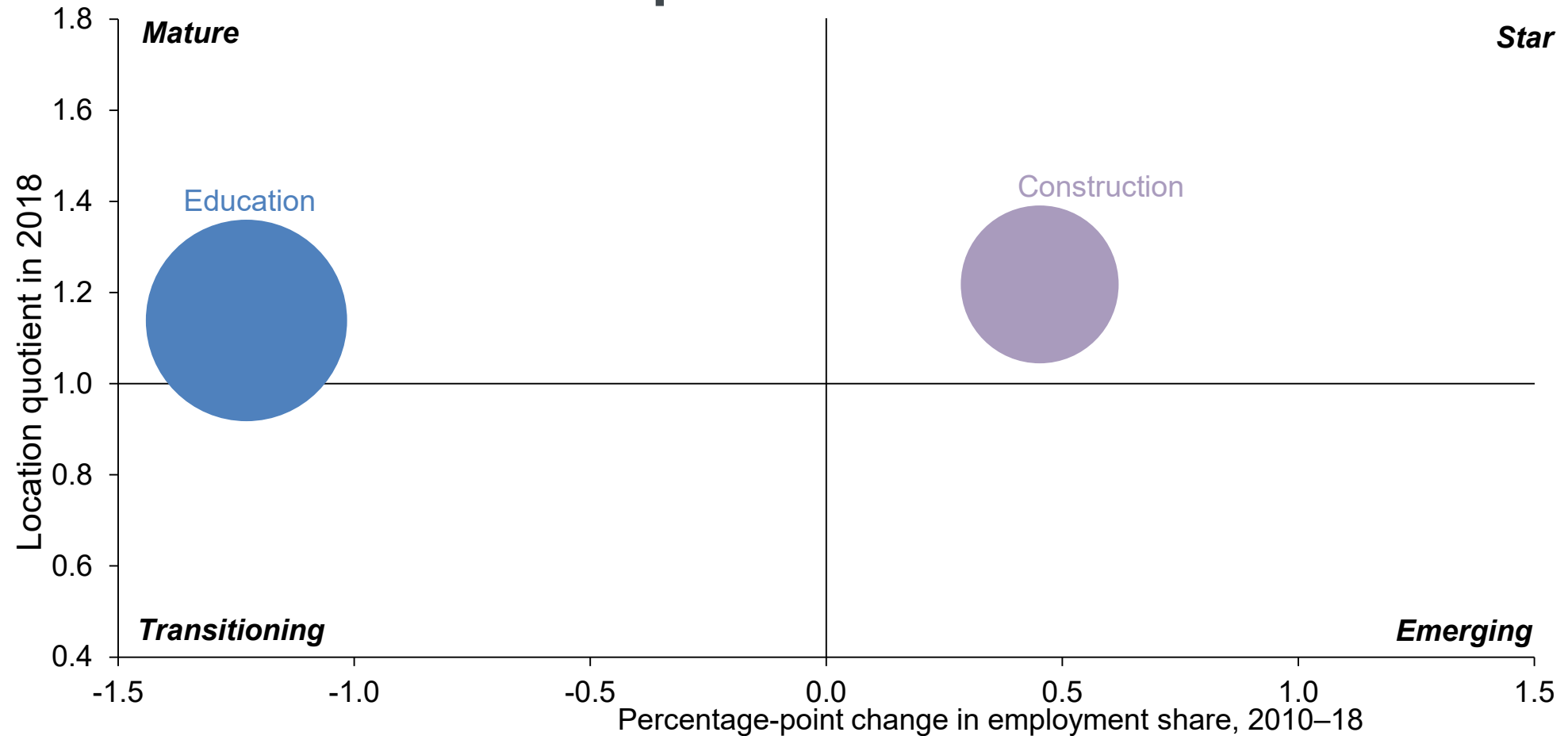
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Energy, IT and Business and Financial Services Help Set Texas Apart from Nation

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

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

Mature — *Star*

Location quotient in 2018

Education

Construction

Transitioning — *Emerging*

Percentage-point change in employment share, 2010–18

NOTE: Bubble size represents cluster share of metropolitan statistical area employment.
SOURCES: Texas Workforce Commission; Bureau of Labor Statistics.
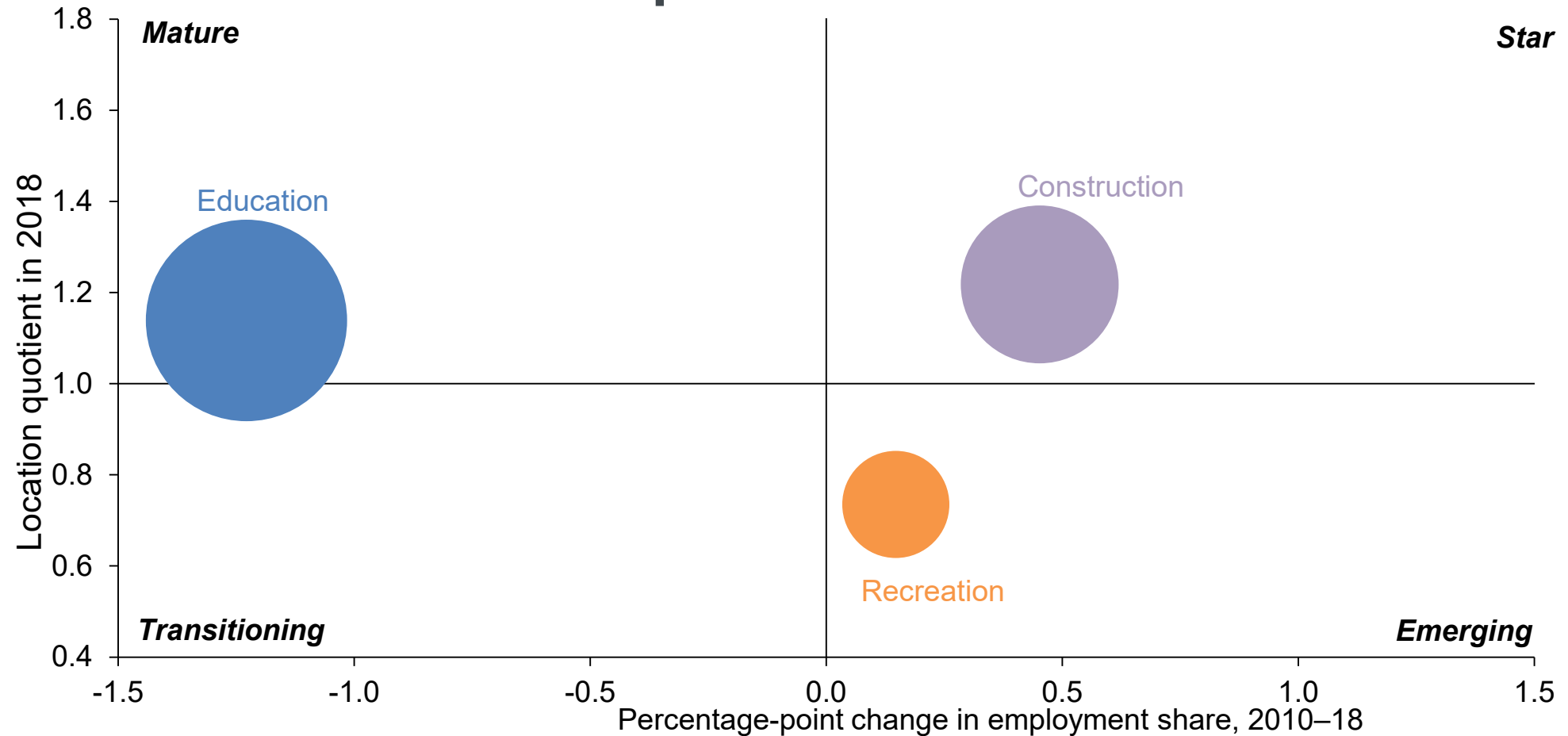
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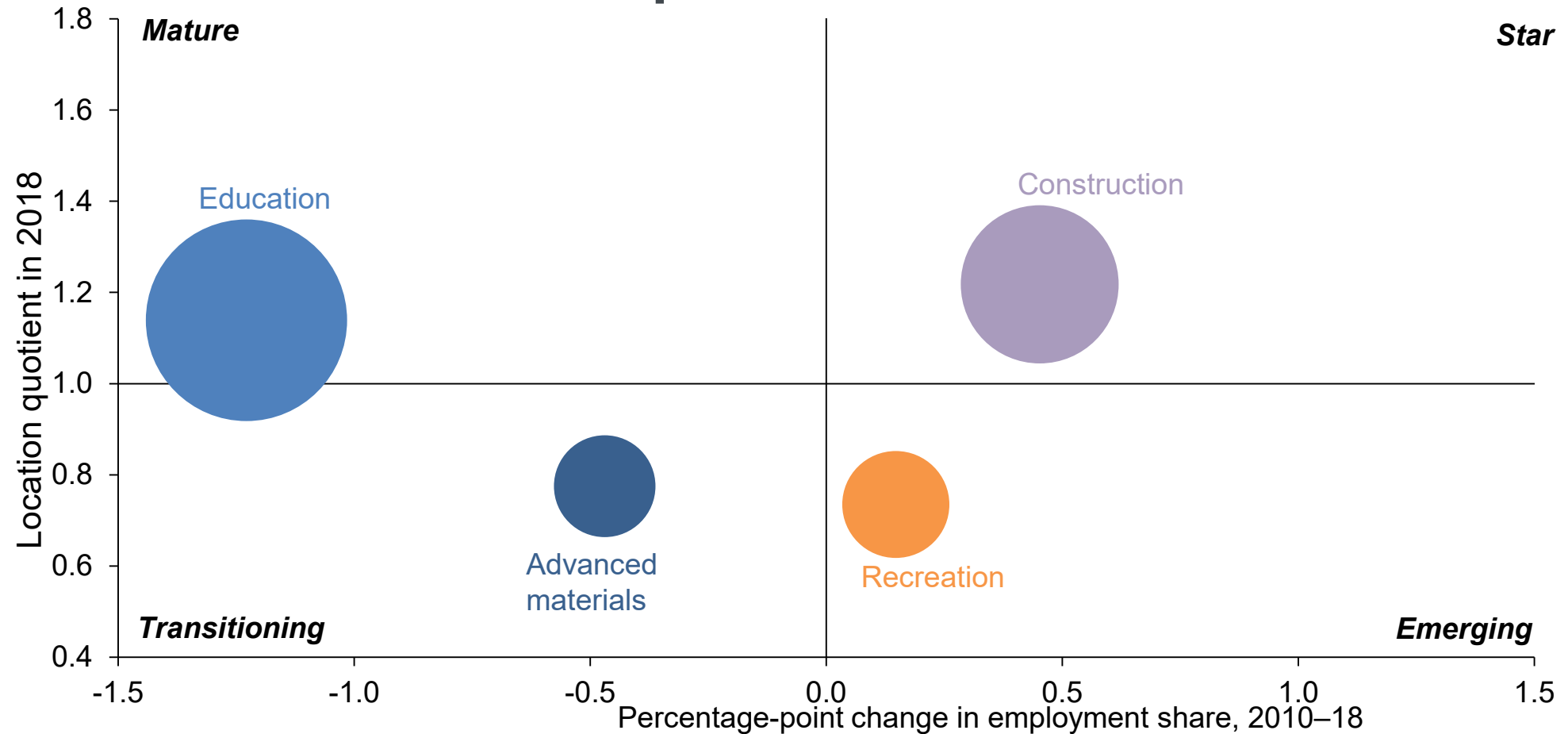
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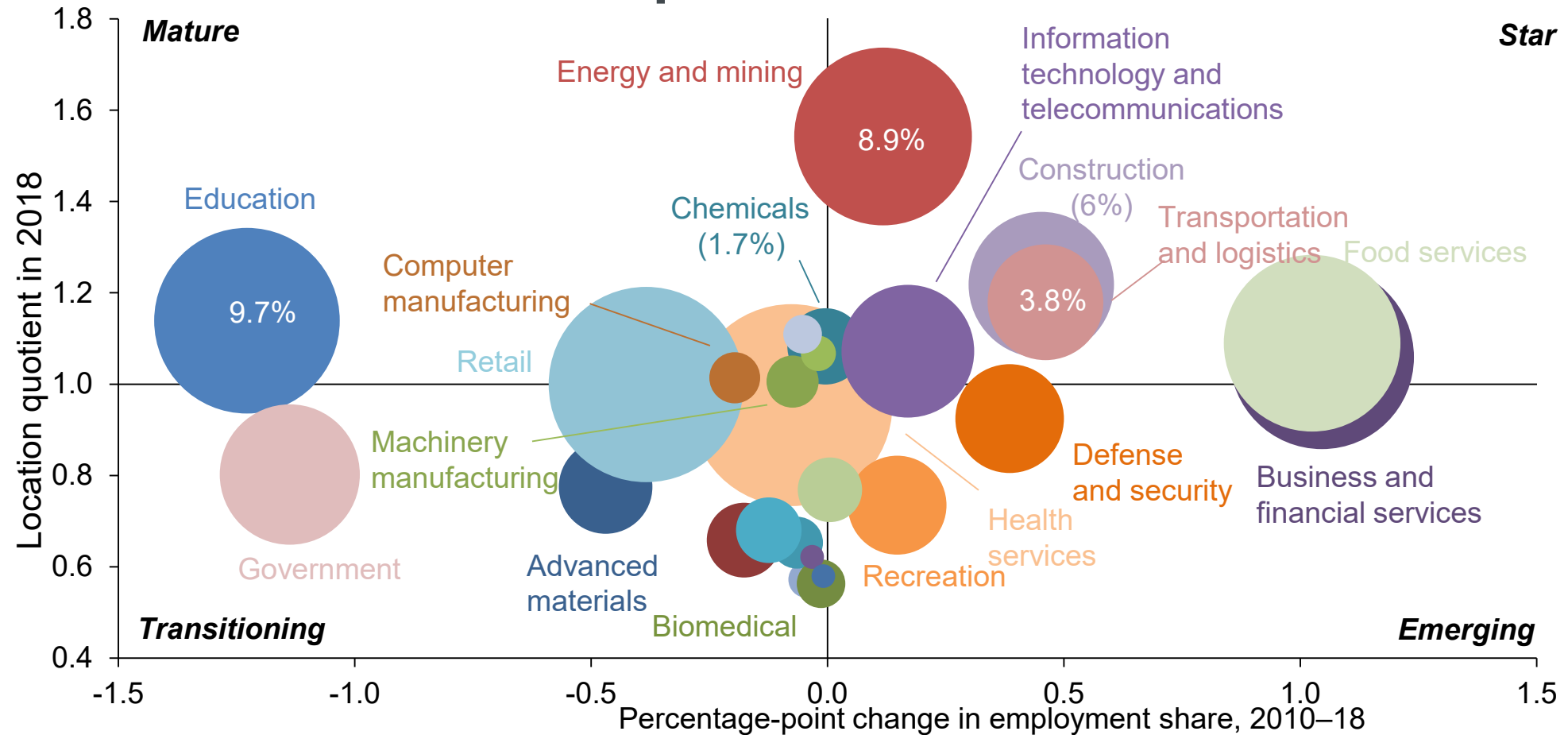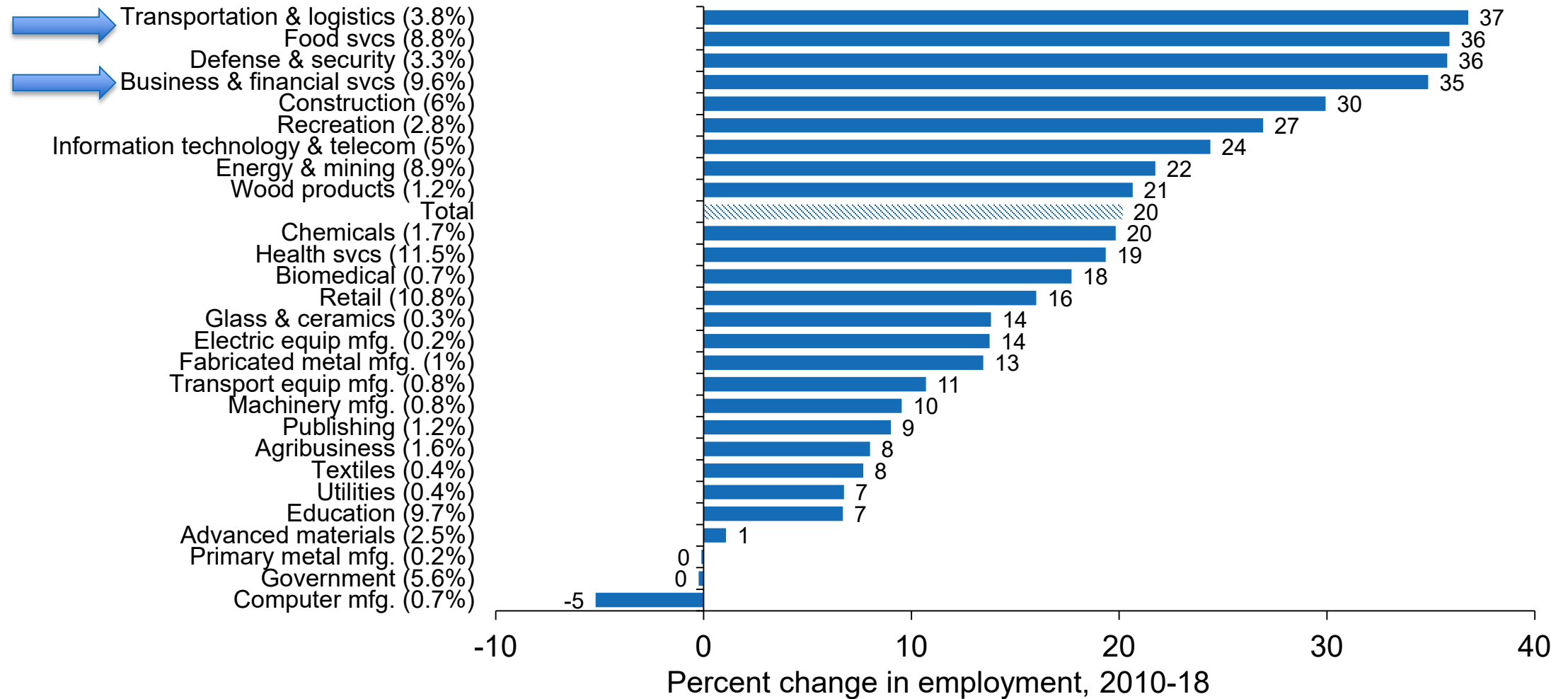
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Energy, IT and Business and Financial Services Help Set Texas Apart from Nation

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

Transportation, Defense and Business Services Among State's Fastest-Growing Clusters


Transportation & logistics (3.8%)   37
Food svcs (8.8%)   36
Defense & security (3.3%)   36
Business & financial svcs (9.6%)   35
Construction (6%)   30
Recreation (2.8%)   27
Information technology & telecom (5%)   24
Energy & mining (8.9%)   22
Wood products (1.2%)   21
Total   20
Chemicals (1.7%)   20
Health svcs (11.5%)   19
Biomedical (0.7%)   18
Retail (10.8%)   16
Glass & ceramics (0.3%)   14
Electric equip mfg. (0.2%)   14
Fabricated metal mfg. (1%)   13
Transport equip mfg. (0.8%)   11
Machinery mfg. (0.8%)   10
Publishing (1.2%)   9
Agribusiness (1.6%)   8
Textiles (0.4%)   8
Utilities (0.4%)   7
Education (9.7%)   7
Advanced materials (2.5%)   1
Primary metal mfg. (0.2%)   0
Government (5.6%)   0
Computer mfg. (0.7%)   -5

Percent change in employment, 2010-18

NOTE: Each cluster's share of total jobs is shown in parentheses.
SOURCES: Texas Workforce Commission; authors' calculations.

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Most Dominant Clusters Pay Better in Texas than in U.S.

Cluster	Texas			U.S.
	2010	**2014**	**2018**	**2018**
Energy and mining	94,829	99,133	96,846	82,731
Construction	56,698	62,167	63,752	60,742
Transportation and logistics	61,041	63,425	62,946	54,941
Education	44,951	44,567	45,925	50,880
Utilities	103,542	106,478	114,481	111,238
Food services	18,190	18,233	19,136	19,516
Chemicals	82,568	87,923	93,920	74,669
Information technology and telecommunications	95,768	98,055	104,069	110,768
Glass and ceramics	52,757	59,602	61,254	55,946
Fabricated metal manufacturing	60,024	62,803	62,488	56,077
Business and financial services	88,257	92,385	93,452	101,722
Computer manufacturing	114,084	117,186	132,138	121,829
Average earnings (total)	54,068	56,448	57,074	56,506

NOTES: Clusters are listed in order of location quotient (LQ); clusters shown are those with LQs greater than 1. Earnings are in 2018 dollars.

SOURCES: Texas Workforce Commission; Bureau of Labor Statistics; authors' calculations.

Migration and Natural Increase Contribute Almost Equally to Population Growth
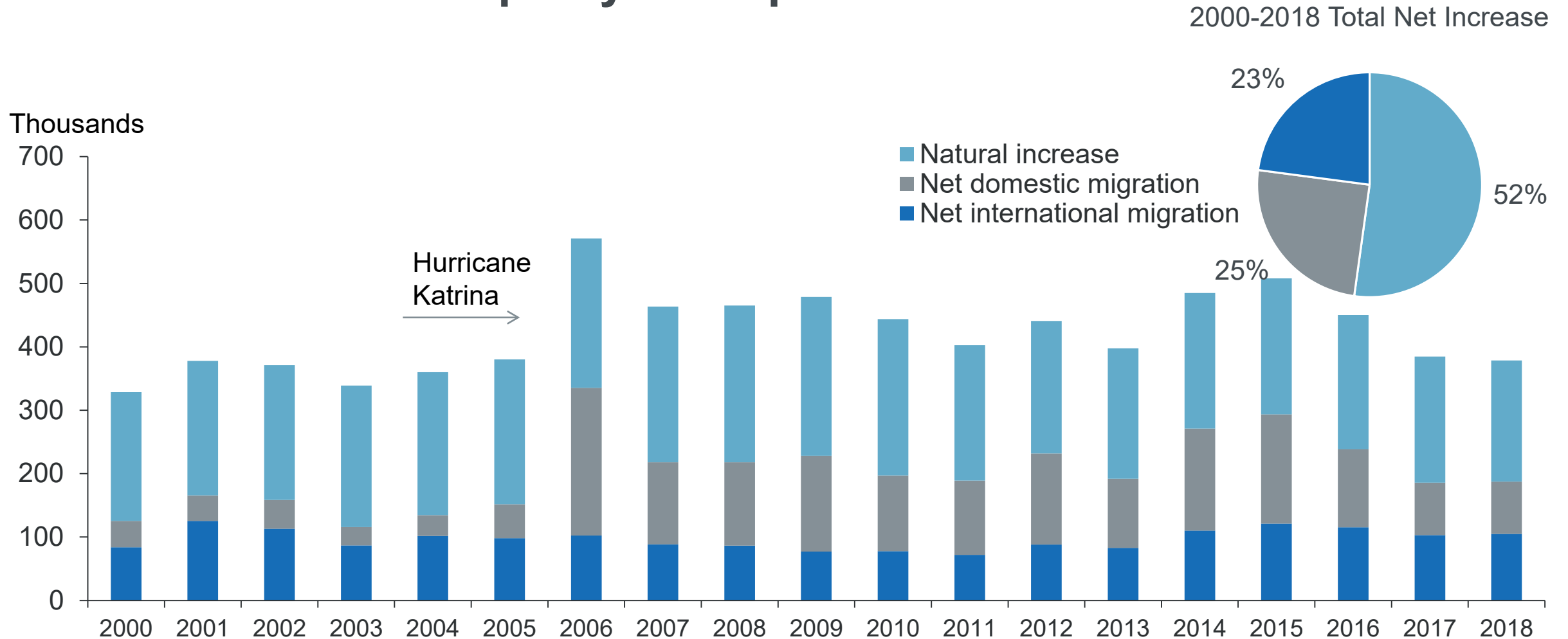
Reason for Migrating to Texas Versus Elsewhere

Reason	Texas	Non-Texas
Relocated for job	50.9	41.3
Family Reasons	26.4	27.0
Amenities	18.4	23.9
Other	4.3	7.8

NOTE: Data refer to 2010-2018.
SOURCES: CPS-ASEC, author's calculations.
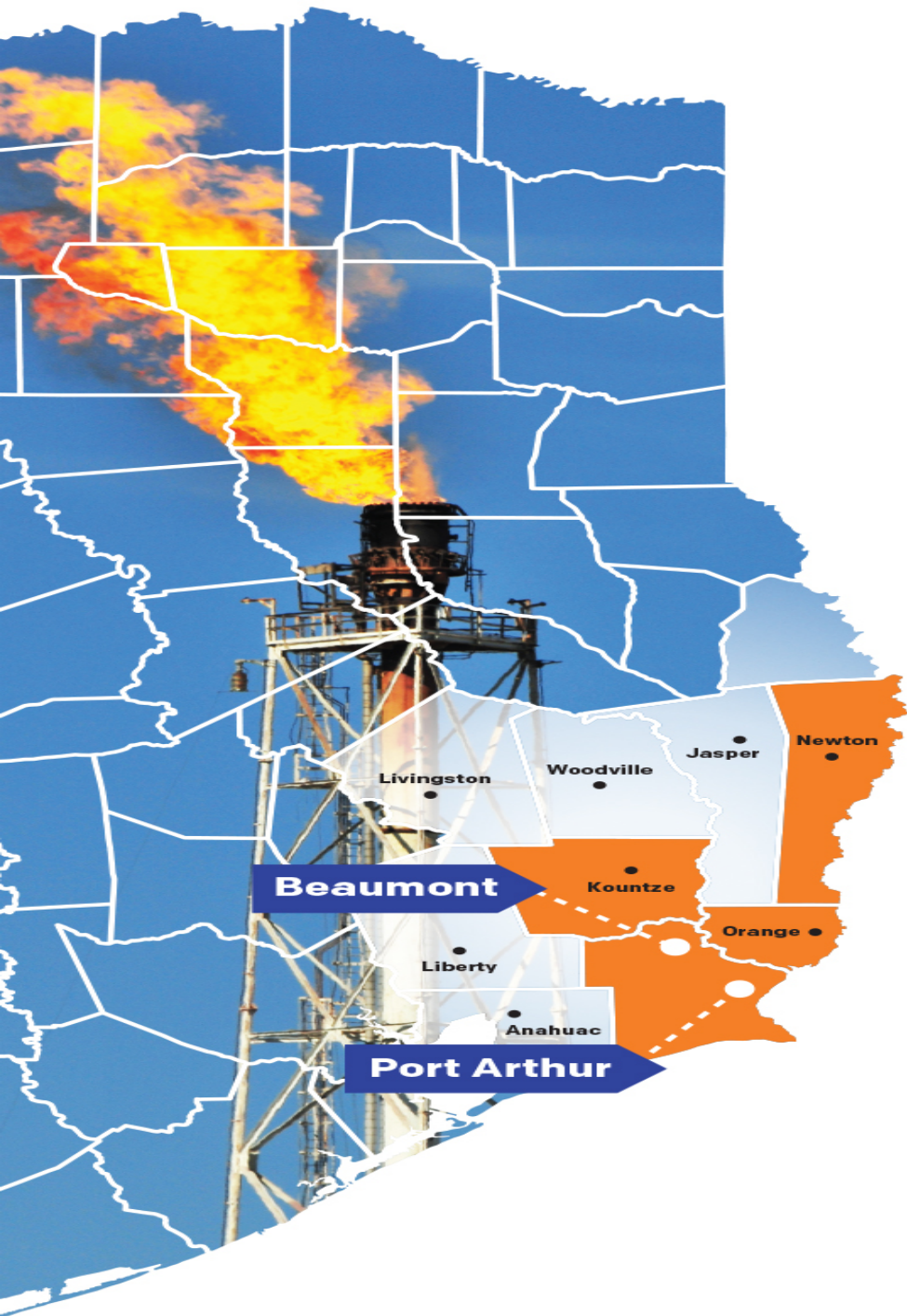
Beaumont— Port Arthur

The Golden Triangle Shines as Petrochemicals Boom

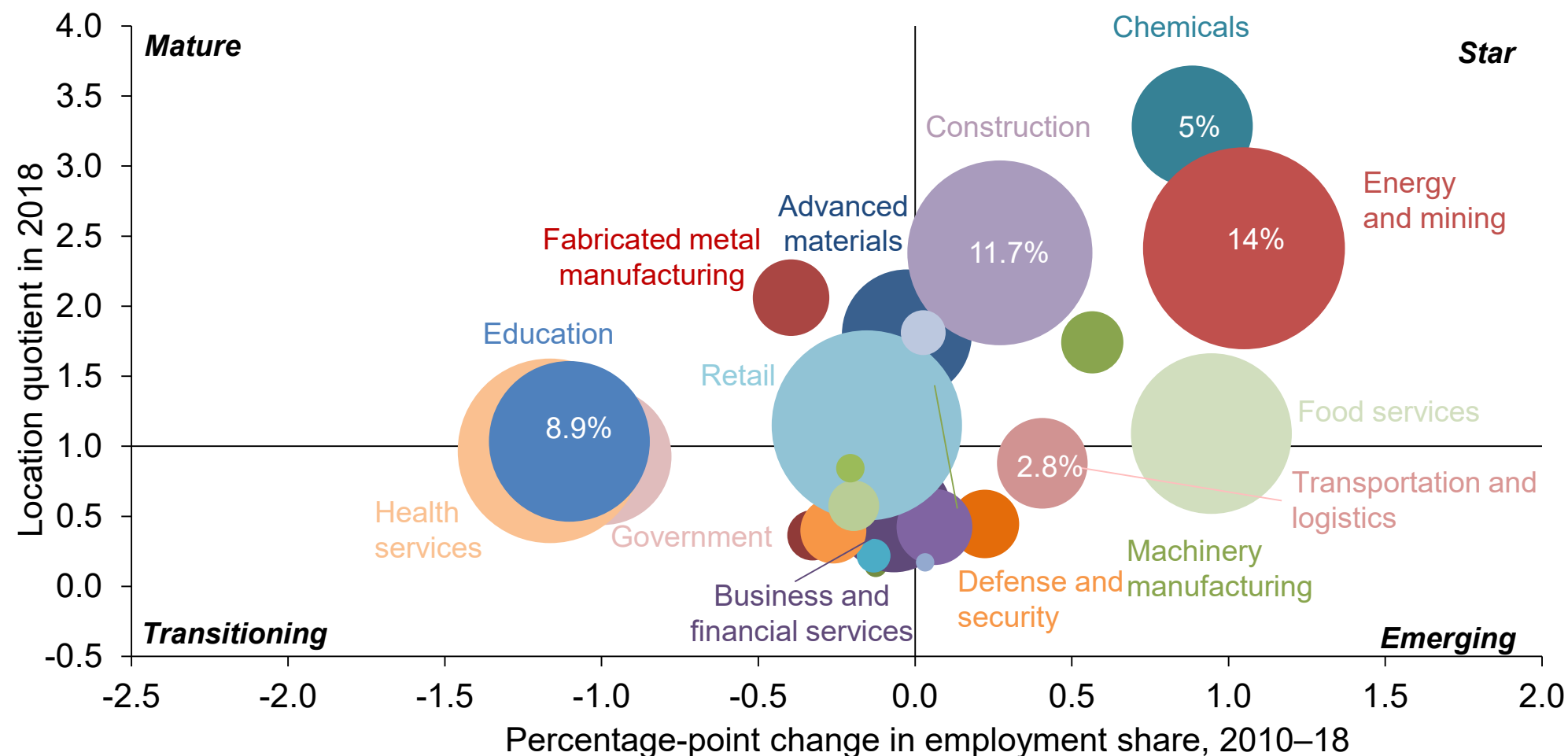Federal Reserve Bank of Dallas

Beaumont-Port Arthur Metropolitan Division: At a Glance

- Population (2018): 409,526

- Population growth (2010–18): 1.4% (Texas: 13.7%)

- Median household income (2017): $49,875

  - Texas: $59,206; U.S. $60,336

- Median household income growth (2010-17): 7.5% (Texas: 8.3%)

Beaumont-Port Arthur:
Overview

- Thriving oil and gas hub, with the nation's largest concentrations of refineries, petrochemical plants and related businesses

- Rapid growth in chemicals, energy and energy-related manufacturing since 2010

- Other important industries such as transportation have grown in support of its outsized manufacturing and energy base

- Sizeable earnings premium in several dominant clusters

- A relatively less-well-educated workforce compared with the state and nation

Petrochemicals and Refineries Central to Beaumont's Economy

Location quotient in 2018 (y-axis)
Percentage-point change in employment share, 2010–18 (x-axis)

Mature — Star — Transitioning — Emerging (quadrant labels)

Chemicals 5%
Energy and mining 14%
Construction 11.7%
Advanced materials
Fabricated metal manufacturing
Education 8.9%
Retail
Health services
Government
Food services
Transportation and logistics
Business and financial services
Defense and security
Machinery manufacturing
2.8%

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

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Energy and Manufacturing Payrolls See Strong Growth

| Cluster	Percent change in employment, 2010–18
Machinery mfg (1.3%)	79
Textiles (0.1%)	43
Electric equip mfg (0.1%)	34
Chemicals (5%)	25
Transportation & logistics (2.8%)	20
Transport equip mfg (0.6%)	19
Defense & security (1.6%)	19
Food svcs (8.8%)	15
Energy & mining (14%)	11
Utilities (0.7%)	7
Infotech & telecom (2%)	6
Construction (11.7%)	5
Total	3
Advanced materials (5.8%)	2
Retail (12.4%)	1
Business & financial svcs (4.7%)	1
Health svcs (11.7%)	-7
Education (8.9%)	-9
Primary metal mfg (0.4%)	-11
Government (6.4%)	-11
Recreation (1.5%)	-13
Fabricated metal mfg (2%)	-14
Wood products (0.9%)	-16
Publishing (0.4%)	-23
Agribusiness (0.9%)	-25
Biomedical (0.2%)	-40
Glass & ceramics (0.3%)	-41

NOTE: Cluster's share of total jobs is shown in parentheses.
SOURCES: Texas Workforce Commission; authors' calculations.

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Overall Job Growth Slower than Texas; Expansion in Select Top Sectors Outpaces State and U.S.

Percent change in employment, 2010–18
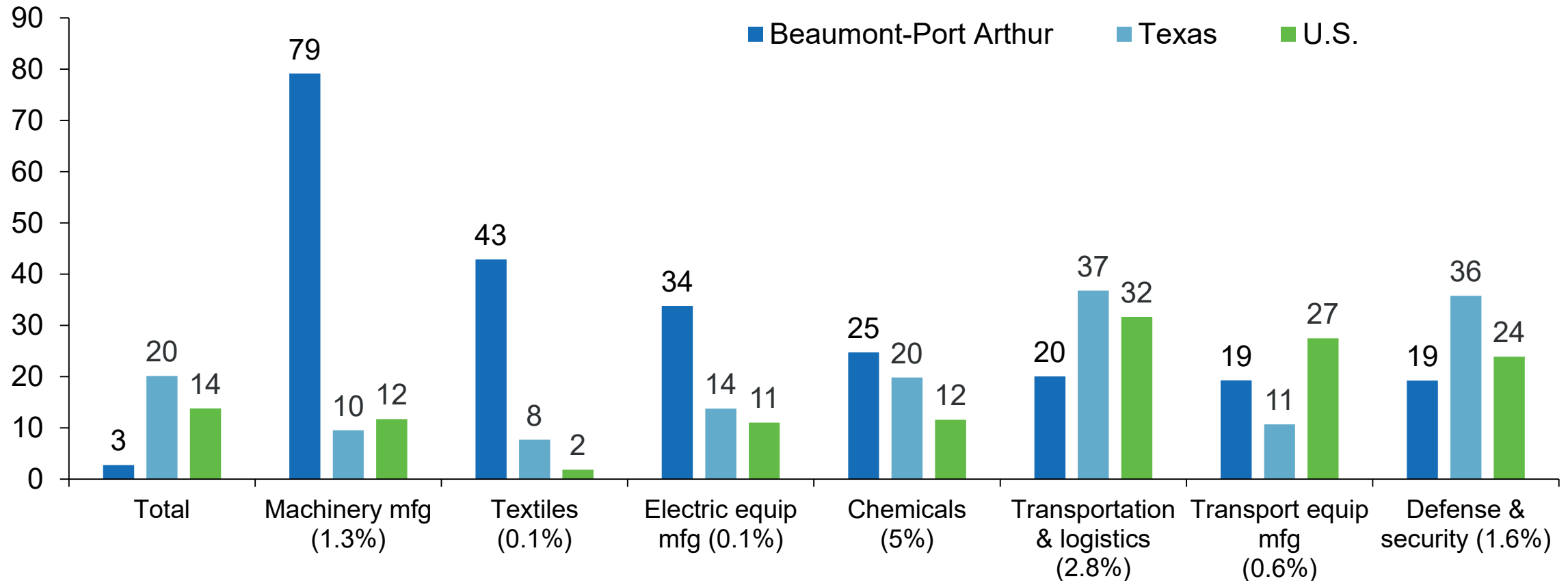
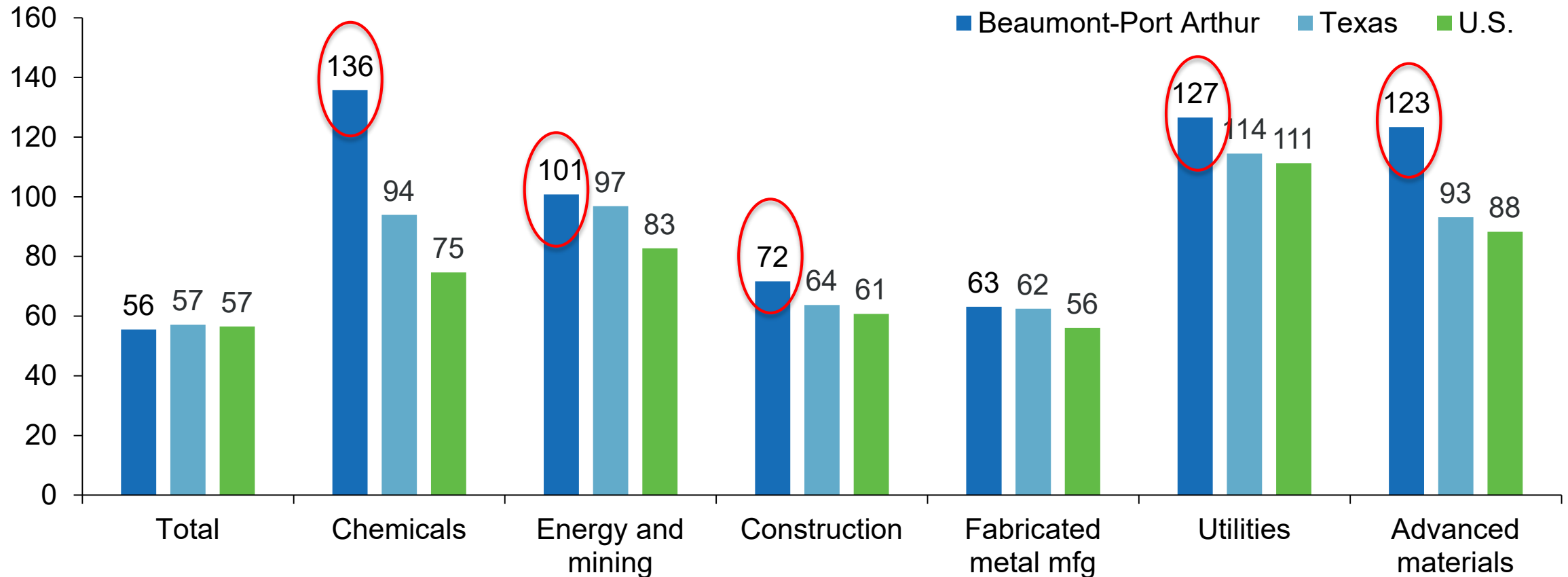NOTE: Each cluster's share of total jobs in Beaumont is shown in parentheses.
SOURCES: Texas Workforce Commission; authors' calculations.

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Earnings in Energy-Related Clusters Outpace U.S. Averages

| Cluster | Beaumont | | | U.S. |
	2010	2014	2018	2018
Chemicals	107,307	121,526	135,740	74,669
Energy and mining	90,915	93,168	100,811	82,731
Construction	62,892	66,807	71,632	60,741
Fabricated metal manufacturing	64,952	68,229	63,132	56,077
Utilities	127,936	119,551	126,586	111,238
Advanced materials	92,908	107,908	123,322	88,294
Machinery manufacturing	62,238	64,415	70,480	71,072
Primary metal manufacturing	71,483	73,801	76,013	69,706
Retail	30,083	30,491	32,159	32,066
Food services	17,928	16548	17,558	19,517
Industry Cluster with LQ >1	57,306	67,990	68,791	
Industry Cluster with LQ <1	57,579	52,693	55,630	
Average earnings (total)	50,689	53,556	55,523	56,506

NOTES: Clusters are listed in order of location quotient (LQ); clusters shown are those with LQs greater than 1. Earnings are in 2018 dollars.

SOURCES: Texas Workforce Commission; Bureau of Labor Statistics; authors' calculations.

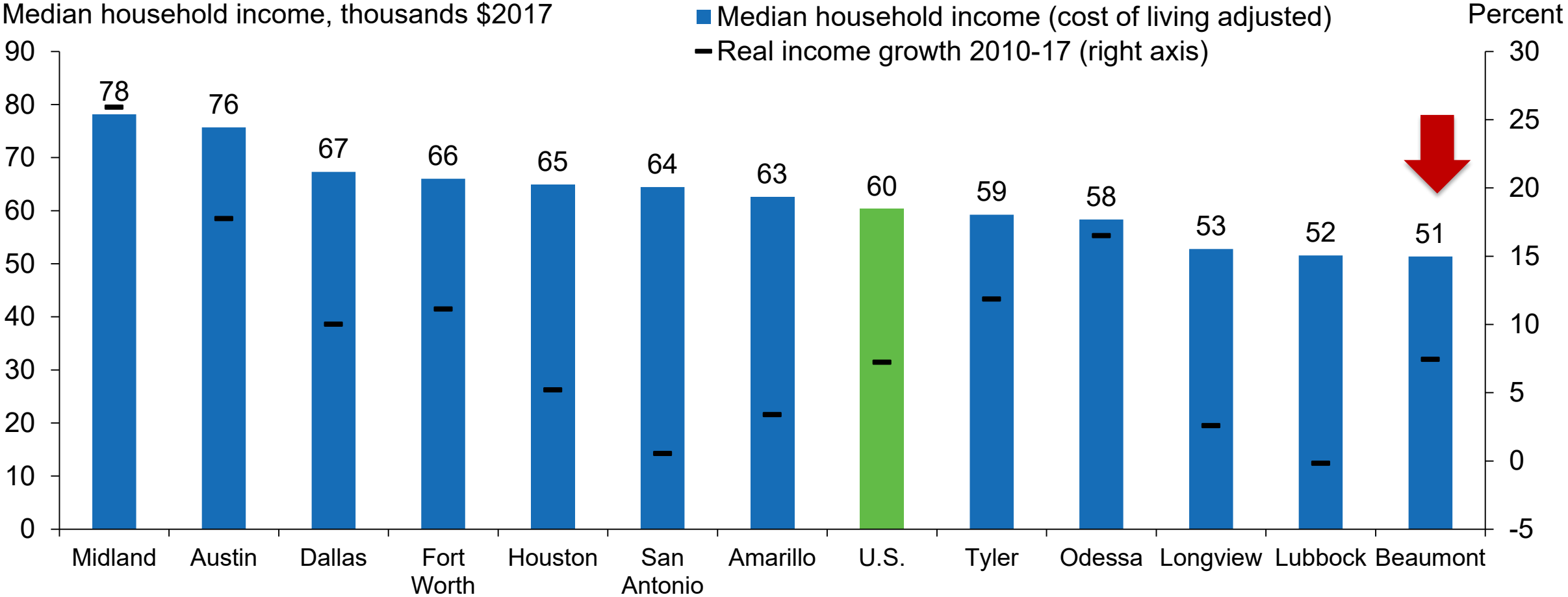# Sizeable Earnings Premium Prevails in Many Leading Sectors

Thousands of 2018 dollars

Legend: ■ Beaumont-Port Arthur ■ Texas ■ U.S.

Sector	Beaumont-Port Arthur	Texas	U.S.
Total	56	57	57
Chemicals	136	94	75
Energy and mining	101	97	83
Construction	72	64	61
Fabricated metal mfg	63	62	56
Utilities	127	114	111
Advanced materials	123	93	88

NOTE: Data refer to 2018 average annual earnings.
SOURCES: Bureau of Labor Statistics; Texas Workforce Commission; Federal Reserve Bank of Dallas.

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Adjusted Median-Household Income Below U.S.

Education Levels in Beaumont-Port Arthur Trail State and U.S.

Beaumont-Port Arthur is Slightly Younger than the Nation

Percent

Age (years)

	Austin	Dallas	El Paso	Fort Worth	Beaumont	Houston	Longview	McAllen	Midland–Odessa	San Antonio	Tyler	Texas	U.S.
Over 64 years	10	11	12	12	15	11	16	11	10	13	16	12	16
55–64 years	11	11	11	12	13	11	13	8	10	11	12	11	13
25–54 years	46	43	39	41	39	42	37	37	40	41	37	41	40
15–24 years	14	14	16	14	13	13	13	16	15	14	14	14	13
Under 15 years	20	22	23	22	20	22	21	28	24	21	20	22	19
Median age	34.7	34.8	32.4	35.2	36.7	34.4	36.8	29.2	31.0	34.7	37.5	34.7	38.1

■ Under 15 years　■ 15–24 years　■ 25–54 years　■ 55–64 years　■ Over 64 years　◆ Median age
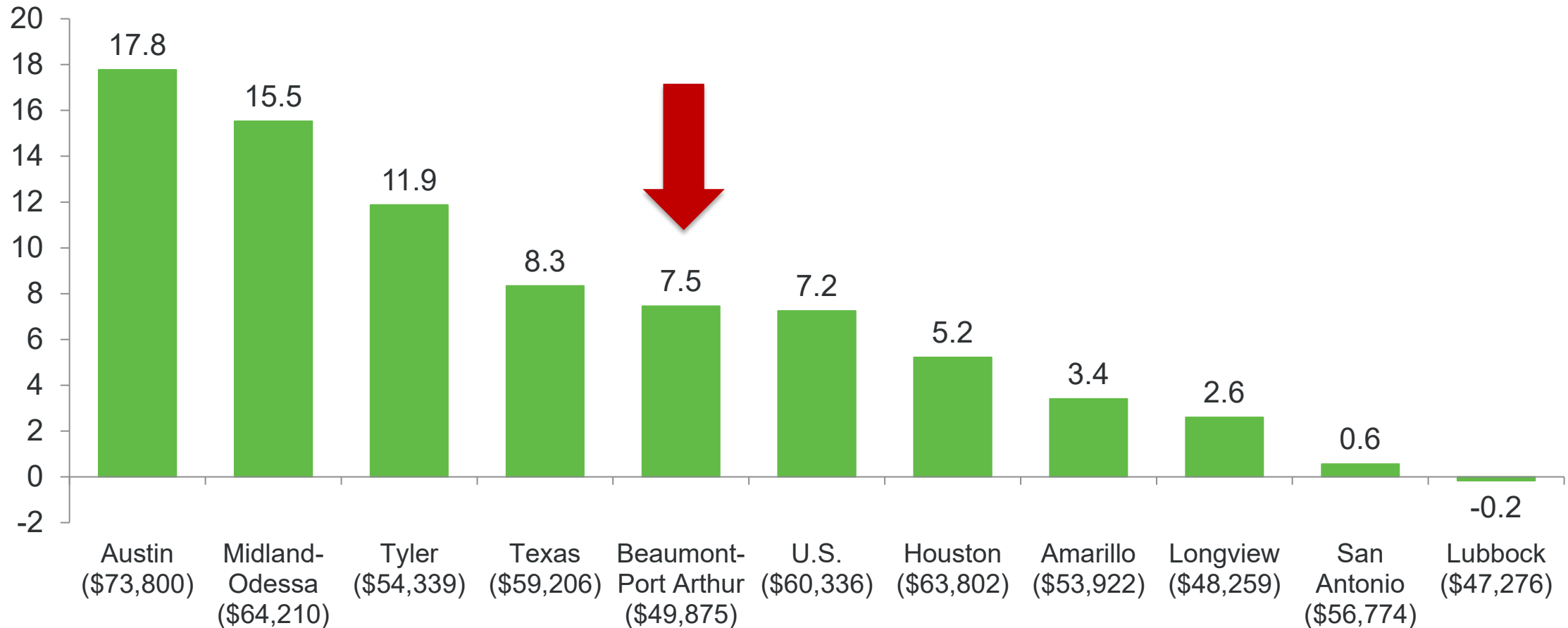
SOURCE: Census Bureau, 2017 American Community Survey 1-year estimates.

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Key Takeaways

- Each metro has a unique fingerprint but together they make up the Texas commercial mosaic
- Cities over time tend to grow when they can exploit their natural and economic advantages
- Size and industrial composition plays a role in pace of growth
- Smaller metro areas play an important role in the state's economy
- Small metros in Texas have grown or maintained their standing even as smaller cities across the U.S. have shrunk
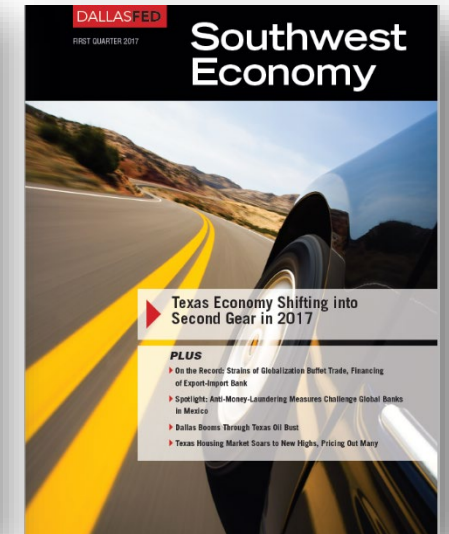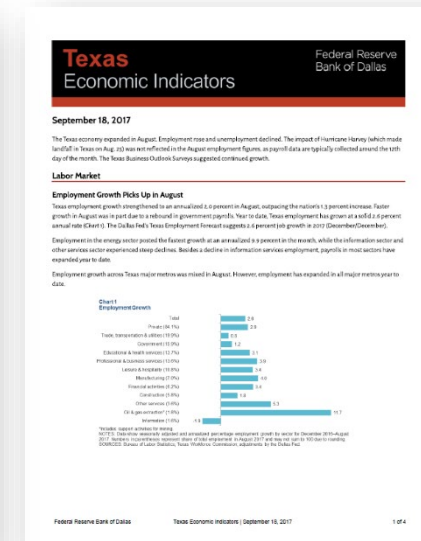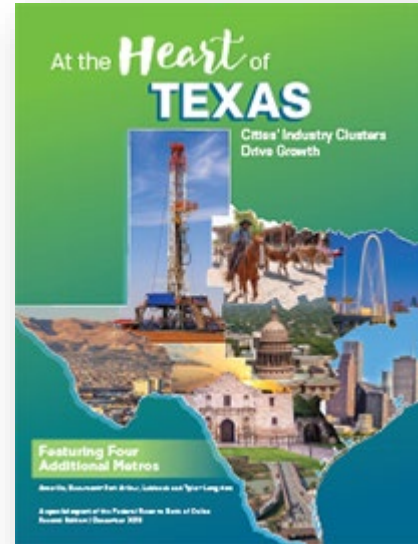
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