

Texas Triangle: Economic Engine of the Southwest

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The Takeaway

Texas' four largest metros (Dallas-Fort Worth, Houston, Austin and San Antonio) function as one large economic entity with each playing complementary roles. Together, they represent 68 percent of Texas jobs and 73 percent of the state's income.

The Texas Triangle is outlined by Dallas-Fort Worth (DFW), Houston and San Antonio, with Austin just inside the Dallas-San Antonio line. These four metro areas are the economic heart of Texas, holding 68 percent of its jobs and earning 73 percent of its income.

The four Texas Triangle cities come together to form a great economic engine that serves Texas

and much of the southwestern United States. These cities are best understood as one economic entity that is divided by history and geography. Although miles apart, they remain physically close enough that mutual competition has forced them to seek out different and complementary economic roles. This engine has four cylinders that work in close coordination to power the Texas economy.

Largest Metropolitan Areas

Table 1 shows the largest metropolitan areas in the United States ranked by population and identified by their largest central cities. The ranking on the left uses the better-known Metropolitan Statistical Area (MSA) definition, which is a group of counties with a central place of 50,000 or more residents, and with surrounding counties that have economic

Table 1. Metropolitan Areas Ranked by 2012 Population Under Different Metro Definitions

Rank	Metropolitan Area	Population	Rank	Combined Metropolitan Area	Population
1	New York	19,837,753	1	New York	23,368,541
2	Los Angeles	13,037,045	2	Los Angeles	18,213,775
3	Chicago	9,514,059	3	Chicago	9,891,237
4	Dallas-Fort Worth	6,702,801	4	Washington, D.C.	9,334,630
5	Houston	6,175,466	5	San Francisco	8,364,559
6	Philadelphia	6,019,533	6	Boston	7,991,835
7	Washington, D.C.	5,862,594	7	Philadelphia	7,129,715
8	Miami	5,763,282	8	Dallas-Fort Worth	7,097,014
9	Atlanta	5,454,429	9	Miami	6,375,718
10	Boston	4,642,095	10	Houston	6,369,855
11	San Francisco	4,454,159	11	Atlanta	6,088,358
25	Austin	1,835,110	n.a.	Austin	1,835,110
35	San Antonio	2,234,494	n.a.	San Antonio	2,234,494
	Texas Triangle	16,947,871		Texas Triangle	21,768,793

Source: Bureau of Economic Analysis, Regional Economic Information System

or social cohesion. The Combined Metropolitan Area on the right uses the Combined Statistical Area (CSA) definition, which begins with a significant MSA and adds adjacent metropolitan or micropolitan areas, if there is economic integration within the larger group.

For the benefit of Texas bragging rights, the MSA definition works better, placing DFW in fourth place with 6.7 million people and Houston's 6.2 million in fifth. This article relies on the CSA definition. To the DFW MSA, for example, the CSA definition adds smaller cities such as Mineral Wells, or to Houston, cities such as Brenham and Huntsville. The CSA definition squeezes out a little more industry-level information in defining the economic role of each Texas Triangle metro.

San Antonio and Austin are the 25th and 35th largest MSAs by population in 2012. Neither is part of a CSA, but their ranking as metro areas place them in impressive company. San Antonio's population ranks with Portland or Orlando, while Austin is similar to Nashville or Indianapolis.

Looking at MSA rankings, New York is first with 19.8 million, followed by Los Angeles with 13 million, and Chicago with 9.5 million. Then population falls to 6.7 million in DFW and 6.2 million in Houston. Although Texas holds these next two places, the Gulf Coast somehow seems cheated out of a great megalopolis. The impression is more pronounced by looking at the CSA rankings.

There is a solid case for fixing this apparent anomaly by simply adding Houston and DFW together. It is not that they would count as a single metro under federal definitions but that Texas history and geography conspired to separate Dallas and Houston 170 years ago. Today, economic and social integration is extensive, and — as will be shown — the two economies strongly complement each other. In fact, it can be argued that nearby San Antonio and Austin could be added on similar grounds, and the Texas Triangle treated as a very large and highly coordinated economic system.

Adding these metropolitan areas together brings scale. A combined Houston and DFW rank just behind Los Angeles if the MSA definition is used and ahead of Los Angeles under the CSA ranking. The combined Texas Triangle metros are second only to New York on either list. But there is more than size that matters here. These cities — especially Houston and DFW — often think of themselves as economic rivals. But this idea fails if each takes a different economic role, providing a distinctive group of goods and services to other Triangle cities. In this case, instead of rivals, the success or failure of any one city is an event shared by the entire region.

Proximity, History, Geography

Simple proximity drives a high degree of economic interaction among the Texas cities. Economists often use a “gravity model” to measure the likely interaction among different places. Gravity defines the attraction between two objects as directly proportional to their mass and inversely related to their distance squared. The economic analogy is that attraction between two places is proportional to their population and inversely related to the square of the distance between them.

Table 2 shows intense economic interaction among Texas Triangle cities and limited relations with other major U.S. metros. The figures are scaled so that the interaction between Houston and DFW is 100.0. The strongest interaction in the Texas Triangle is between San Antonio and Austin at 137.2, and the weakest is between DFW and San Antonio at 27.5. Triangle city interactions are large compared with interactions with other major U.S. metros. Only three combinations are as much as one-tenth of the DFW-Houston linkage: Chicago with DFW and Houston, and Atlanta with Houston.

How do the Triangle cities earn their living? To define their economic role, economists focus on the metro area's sales of goods and services to places outside the local area. These sales generate new income for the area, in contrast to many inherently local activities such as laundries, dry cleaners and grocery stores. These businesses provide critical services but bring no new income into the community.

Table 3 shows selected sectors that sell goods or services from each Texas metro to other regional, national or global customers. It shows the percentage share of income from that sector that is derived from external sales. If no number appears, less than 12 percent of the sector's income is from exports, and the industry is local or relies on imports to

Table 2. Strong Economic Interaction Among Triangle Metros
(Gravity Model Scaled at Houston/Dallas = 100)

	Austin	Dallas-Fort Worth	Houston	San Antonio
Austin	–	44.6	90.2	137.2
Dallas-Fort Worth	44.6	–	100.0	27.5
Houston	90.2	100.0	–	74.3
San Antonio	137.2	27.5	74.3	–
Atlanta	2.5	8.3	11.2	2.6
Boston	0.5	1.4	1.8	0.5
Chicago	2.9	10.3	10.5	3.1
Los Angeles	2.6	5.9	7.0	3.3
Miami	1.2	3.1	5.3	1.4
New York	2.3	6.8	8.0	2.5
Philadelphia	0.8	2.6	3.2	0.9
Phoenix	1.6	3.5	4.1	2.1
San Francisco	0.6	1.4	1.5	0.7
Washington D.C.	1.0	3.1	3.8	1.1

Sources: Google Maps and authors' calculations

fill the community's needs. The positive numbers are the list of sectors that drive local growth. Exports from these Texas Triangle cities fall into six groups: energy, transportation, technology, finance, tourism and government.

Table 3 does a good job of describing these local economies. Austin, for example, began as a planned capital, with Mirabeau B. Lamar choosing the site for its natural beauty and interior location. It would struggle against isolation and Indian attack for many years to secure its political and economic role. Until the 1960s, its economy was based on being a state capital and home to the University of Texas. In recent years, a large technology industry has developed, defined by computer and electronics manufacturing. This basic story is confirmed by the data in the first column of Table 3, with tech and state government sectors standing out. Strength in eating and drinking places (as well as several retail sectors not listed) can be attributed to the large state university.

Houston is about energy, transportation to move energy, and the Port of Houston. Oil exploration and production, oil services, refining and petrochemicals operate on a world-class scale, supported by pipelines, machinery and fabricated metal. Houston's port is the second largest in the nation by tonnage, and near 80 percent of that tonnage is energy related.

In DFW, there are three key clusters: transportation, technology and finance. Dallas was founded in 1841 as the only natural ford on the Trinity River, with no access to the sea except by moving goods to the Mississippi River. The railroads arrived after the Civil War, opening the Blackland Prairie and giving DFW a key inland location. Fort Worth began as a barrier against Indian attack and later was an important railhead for the cattle industry.

The DFW area has evolved into the primary distribution point for Texas, Oklahoma, Arkansas and other surrounding states. Goods flow into the metro area by rail, truck and air to be broken down for further distribution to towns and cities throughout Texas and beyond. Goods from Asia arrive by rail from the west coast to join the flow of domestic goods for distribution. If the Trinity River had been navigable as far as DFW, combining this central distribution point with deep water access, Houston probably would not be a major port today.

DFW has its own tech sector, built on a history of aircraft production, defense electronics and telecommunications. Dallas has become the state's financial center. Since the crash of the 1980s and the loss of most of the Texas banking system, out-of-state banks have concentrated activity in Dallas.

San Antonio was 100 years old before the Texas Revolution, part of the Mexican presidio and mission system. Today it remains strongly tied to South Texas and Mexico, both culturally and economically. San Antonio stands out as a highly diversified city, providing a wide array of goods and services, mostly to the South Texas region. Again, Table 3 shows a transportation cluster, this one serving the Texas border cities and the maquiladora industry in northern

Mexico. There is regional banking and insurance, a thriving tourist industry indicated by the concentration of bars, restaurants and gasoline stations, as well as a large military presence.

At first glance, there is substantial overlap — and potential competition — in oil, tech, and transportation industries, but the work of the Texas Triangle in fact has been neatly divided up. Oil producers are found in all four cities, for example. But Houston’s energy market is national and global in scope, serving a market that extends far beyond Texas. In contrast, the other cities are regional service centers: Fort Worth serves the Panhandle, Oklahoma and North Texas; San Antonio focuses on South Texas; and Austin serves the Giddings area and the Gulf Coast.

Similarly, transportation activities divide into those related to the Port of Houston, the distribution of goods from DFW to Texas and surrounding states, and San Antonio’s truck and warehouse services for the border cities. Tech divides between the computer-related manufacturing in Austin and telecommunications in DFW. As hypothesized, proximity and competition has split up the work of the Texas Triangle, with limited head-to-head competition among the cities.

Table 3. Percent of Sector Income Derived from Metro-Level Exports

	Austin	Dallas-Fort Worth	Houston	San Antonio	Texas Triangle
Energy					
Oil Producers	39.8	79.6	91.3	47.4	85.7
Oil Services		62.8	89.3		80.2
Fabricated Metals			45.9		16.0
Machinery			64.0		33.3
Refining			83.2		62.0
Chemicals			47.4		15.3
Pipelines		50.0	32.3	77.6	84.8
Utilities			55.4		
Transportation					
Wholesale Trade			23.7		22.5
Water			65.2		
Air		62.5	46.2		
Truck		21.3	18.0	20.6	14.5
Warehousing				20.0	
Transport Support		14.5	48.7		28.6
Repair and Maintenance		23.1	24.8	1.4	23.1
Technology					
Computer Manufacturing	76.9	32.4			18.0
Electronic Equipment Manufacturing	19.4				
Telecommunications		46.2			14.5
ISP and Data Processing	30.1	56.7		75.5	40.1
Finance					
Banking		34.2		15.3	
Real Estate	20.0	31.0			18.0
Administrative Services		21.9			13.8
Tourism					
Accommodations				13.8	
Eating/Drinking Places	16.7			27.0	
Gasoline Stations				17.4	
Government					
State	48.7				
Federal Civilian				43.8	
Federal Military				71.7	

Sources: Bureau of Economic Analysis and authors’ calculations

Exports from the Triangle Cities

As seen in Table 1, the combined population of the Triangle metro areas puts them in the same class as New York, Los Angeles and Chicago. These Texas cities share intense economic interaction, are highly integrated, and essentially function as a single large metro. This is the highly coordinated engine of the Texas and Southwest economy. The cities are anything but rivals, providing a shared group of goods and services that contributes to their mutual success.

As a single economic entity, what is the bigger role of the Texas Triangle as a key part of the state or nation? The right-most column in Table 3 adds the Texas Triangle cities together and shows the exporting sectors from the combined metros. Some local activities disappear from this list because they are shared among Triangle cities only — air or water transportation in DFW and Houston, for example — but are not part of larger national markets. The remaining Triangle exports are heavy on energy. Houston’s national and global exports are included, of course, but the regional oil centers also reach well outside the Triangle to other states and cities. Similarly, all the transportation hubs serve larger surrounding areas, meaning they count as Triangle exports; tech industries sell to larger markets from both Austin and DFW.

One concern about the Triangle economy revealed by Table 3 is the weakness of the service sector. For example, banking disappears when the four metros are combined, implying that the DFW financial industry has no significant reach beyond the other Texas cities. Professional, business and scientific services show up as a potential export only in Austin, and there is no evidence that these higher-order, white-collar services are exported to the rest of the United States. Urban economists often point to these highly skilled professional services as the hallmark of a successful global city, and the Triangle cities — alone or combined — seem to fall short.

Spreading the population across the state offers more livable places — less congestion and cheaper housing, for example — but one cost associated with the loss of that single megalopolis may be the lack of scale needed to justify the highest-order urban functions. On their own, the Triangle cities may simply lack the size and gravitas to justify a global financial center like London, a communications center like New York, or the high-end retail of Los Angeles’ Rodeo Drive. 🗝

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