

# *The Southwest* ECONOMY

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## Oil Extraction in The Southwest:

*Smaller, Profitable  
And at Home  
In the City*

Since the oil price collapse of the 1980s, volatility in the oil market has forced the industry to cut payrolls and consolidate to stay competitive.<sup>1</sup> These trends have reshaped the geographic distribution and nature of oil extraction, turning it into an urban and technology-based industry concentrated in Texas and Louisiana.

Oil extraction employment has continued to fall in the United States, and the significance of the industry to the oil-based Southwest economy has diminished steadily.<sup>2</sup> However, the reasons for declining employment have changed, reflecting a stronger, more profitable industry. Recent job losses have

resulted from strategic realignment and from cost pressure generated by new exploration technology and gains in productivity.

This article examines growth trends in oil extraction, the industry's consolidation into a few large oil cities and the implications for economic growth in the Southwest. We find that the same trends that have reduced jobs overall—an international focus on exploration, new technology and competitive cost pressure—have worked to move jobs into the city. Although few Southwest cities have seen any net gain in oil-related employment since 1987, recent economic performance has been hurt less than might be expected as oil cities have found other avenues to grow. From 1987 to 1993, cities with large numbers of oil extraction jobs were at the forefront of the Southwest's recovery from the oil bust.

### Recent Trends in Oil Extraction

Oil extraction employment since 1987 in the United States has been shaped by several factors. Low oil and natural gas prices still play a key role; the Organization of Petroleum Exporting Countries still engages in cartel pricing, but now recognizes oil-on-oil competition from basins around the world. OPEC

prices continue to reflect monopoly revenues but are presumably set low enough to discourage exploration and production from non-OPEC basins, including those in the United States.

Volatile oil markets also play a role in restraining job growth. For decades before the oil bust, oil prices were very stable and controlled by the Texas Railroad Commission or by OPEC. Stability was the norm, and when an occasional oil price spike occurred, it stood out from long-term trends and a specific event could explain it—a refinery strike, war in the Middle East, an OPEC meeting and so forth. Since the late 1980s, volatility has increased and, despite OPEC's best efforts, prices have fluctuated widely and often.

Price volatility may restrain activity if producers are adverse to price risk, or if it raises the cost of doing business as producers hedge against price risk. More importantly, however, price volatility now shapes every oil company by forcing it to reduce fixed costs. It is important to be able to quickly *expand or contract activity* in response to changing market prices. One way to accomplish

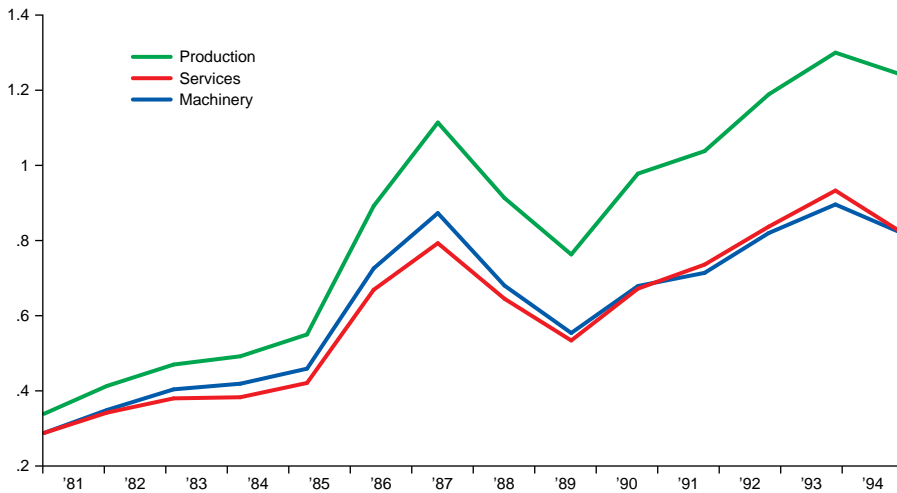
I N S I D E

Should High Gold  
Prices Be a Source  
of Concern?

Chile: The Big Saver

**Chart 1**  
Implied Productivity in Oil and Gas Mining

Ratio: Hourly wage to oil price



SOURCE: Bureau of Labor Statistics, Department of Energy and author's calculations.

this is by shifting oil market risk to temporary employees, outside suppliers, contractors and consultants, and by hiring fewer workers for the permanent payroll. Much work once done by the oil industry is now performed in other industries. This reduces direct oil employment, but opens new opportunities for local businesses in support industries.

Another important trend in the 1990s has been that many of America's largest oil producers shifted their emphasis from domestic to foreign exploration and production. The U.S. onshore fields are perceived as drilled out, and offshore opportunities are mostly confined to the western Gulf of Mexico. Among large, integrated producers in particular, restructuring and downsizing of staff assigned to domestic operations became the hallmark of the early 1990s.

Improved management and technology also is reshaping the industry. Important new tools, such as three-dimensional seismic, coiled tubing, and measurement while drilling, have lowered drilling costs, reduced risk and widened the range of economic prospects available to the industry. The recent strong interest in the Gulf of Mexico, both in deep water and in the subsalt

regions, is largely a product of advancing technology. Chart 1 shows the ratio of industry wages relative to the price of oil, an implicit measure of industry productivity that shows strong gains since 1985.

Finally, oil industry employment in the United States has steadily declined over the past 15 years. The total number of jobs rose by 491,000 from 1973 to 1981, or by 256 percent. Many of these gains were quickly erased after the oil bubble burst in 1981, and the industry lost 374,000 jobs the following six years. The boom and bust in the industry is described in Table 1, which shows changes in industry employment since 1973.

### An Urban Oil Industry

Oil industry trends are shaping not just the level of U.S. oil employment but also its geographic distribution. In particular, an urban

and technology-based oil industry has emerged that operates equally well at home and around the world. This urban industry is headquartered in the southwestern United States. As the oil industry has shrunk, it has shifted a bigger share of its jobs and payrolls into Texas and Louisiana, and especially into the region's largest cities.

Chart 2 shows the share of U.S. oil industry wages, salaries and benefits paid in Texas and Louisiana. These two states received 46.7 percent of the U.S. total as the oil bust began in 1981, 58.6 percent in 1987 and 62.2 percent in 1993. The share of U.S. oil income paid in Houston, Dallas and New Orleans also is tracked in Chart 2, and the growing share in the two states results almost completely from gains in the large cities. In Texas, for example, 83 percent of the wages, salaries and benefits paid by oil producers and oil services in 1993 were paid out in metropolitan areas.

The shift to the cities has been a steady trend since the early 1980s. If this trend is surprising, it is only because we think of oil extraction as a resource-based industry. Yet there is a growing urban component that is becoming footloose—no longer tied to one field or a single oil basin, perhaps working in several U.S. oil basins, perhaps operating overseas, and perhaps both. For example, a producer or service company that in past years operated profitably in a single U.S. oil basin may now find fewer local opportunities. To keep the company viable or make it grow, work must be found elsewhere, and opportunities within the industry spread out geographically. To capitalize

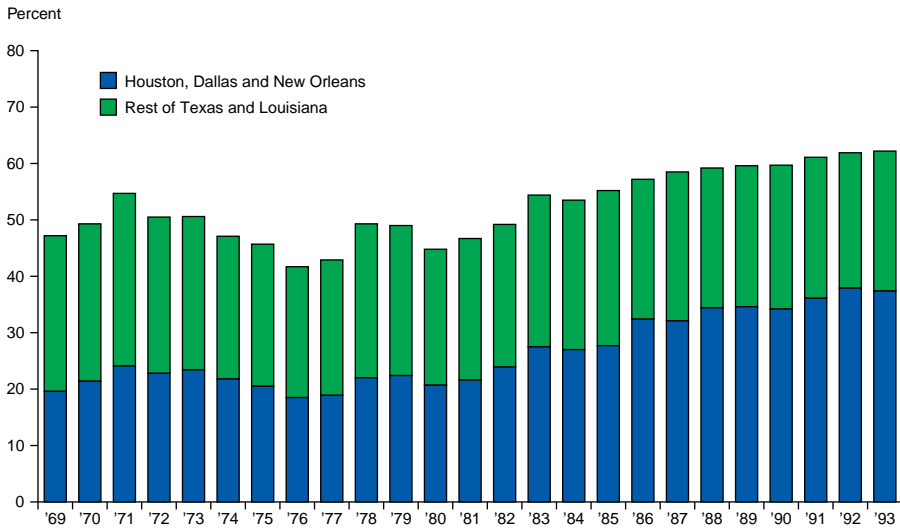
**Table 1**  
Employment in Oil and Gas Production, Services and Machinery  
(Thousands of jobs)

Year	Producers	Services	Machinery	Total
1973	135.6	134.6	45.4	315.6
1981	254.3	430.2	122.3	806.8
1987	199.4	197.0	36.4	432.8
1993	171.2	173.5	37.9	382.6

SOURCE: Bureau of Labor Statistics, Employment and Earnings.

**Chart 2**

Oil Industry Wages, Salaries and Benefits Paid in Texas and Louisiana  
(Percent of U.S. Total 1969 to 1993)



SOURCE: Bureau of Economic Analysis, Regional Economic Information System.

on new opportunities, a bigger oil center—a Houston, Dallas or New Orleans with strong ties to producers and services already operating in many regions—may offer a better central point from which to organize work in multiple basins. The large, integrated oil companies have been footloose for a very long time in the sense of seeking exploration and production opportunities on a global scale. Increasingly, we see large independent producers now operate throughout the United States or overseas.

To better see how the consolidation of oil extraction worked in the United States, we found 29 cities that have (or recently had) a number of oil extraction jobs. The candidate cities were located with the help of the *Oil and Gas Journal's* annual listing of publicly traded producers, Standard & Poor's *Register of Corporations* and various databases that contain information on county or metropolitan area jobs and income. *County Business Patterns* then provided specific detail for the 29 metropolitan areas. Together, the 29 cities represent almost half of U.S. oil employment with headquarters, exploration services and machinery most concentrated in the cities (Table 2). The

post-1987 consolidation of the industry is led by producers, headquarters and exploration services.

Table 3 shows total oil extraction employment for 16 of the 29 cities, all located in Texas and Louisiana, and each city's percentage of the 29-city total in 1987 and 1993. Houston clearly stands apart, making up over one-third of the 29-city total, followed by the Metroplex (Dallas, No. 2, Fort Worth, No. 5), and Midland–Odessa, New Orleans and Lafayette. Houston, Dallas and New Orleans are the cities with the largest concentration of headquarters facilities. Midland–Odessa and Lafayette, in contrast, are primarily service centers for the

**Table 2**  
Twenty-Nine Oil Cities as a Share  
Of the U.S. Oil Industry  
(Percent of Employment in Oil  
Extraction, 1987 and 1993)

	1987	1993
All oil extraction	45.2	47.4
Producers	28.5	41.2
Headquarters	67.6	68.3
Services	36.1	35.2
Drilling	37.1	38.7
Exploration	49.2	56.0
N.E.C.	33.9	31.1
Machinery	73.2	69.7

SOURCE: *County Business Patterns*.

*“Oil industry trends are shaping not just the level of U.S. oil employment but also its geographic distribution.”*

*“The opportunity to be close to a large number of potential clients is an irresistible attraction for suppliers.”*

Permian Basin and Gulf of Mexico, respectively.

The growing footloose part of the industry, operating at home and abroad, has created not just a split between metropolitan and nonmetropolitan areas but also a division between large and small oil cities. Industry consolidation has generally favored those cities that are home to the largest clusters of oil industry activity, especially Houston. Such clustering is not unique to the oil industry. Throughout the U.S. economy we find industry-specific activity such as entertainment in Hollywood, autos in Detroit and financial services in New York.

Three reasons can be given for the formation of large industrial clusters. First, there is the need to be plugged into cutting-edge activity, to be part of the industry’s knowledge loop. Economists call this “informational spillovers”—insights gleaned from professional groups and meetings, from technical small talk and gossip or by keeping an eye on competitors. Second, large clusters allow a specialized labor force to form. A wide

choice of employees with industry-specific skills and experience is attractive to employers; the cluster is similarly attractive to employees because of the range of job alternatives offered them. Finally, just as labor specializes, so do suppliers and financial providers. The opportunity to be close to a large number of potential clients is an irresistible attraction for suppliers.

Note the strong cumulative effects of success. The bigger the city, the more attractive it is; the more attractive it is, the bigger it gets. A city’s advantages are partly built on critical knowledge needed for survival, and partly built on potential cost savings from labor and suppliers. The process works in reverse as well. As a cluster unravels, past success can quickly spiral into failure.

### **Implications for Regional Growth**

For Texas and Louisiana, this is bittersweet economic news. The oil extraction industry is healthy and profitable, exhibiting strong productivity, and skill levels and wages

**Table 3**  
A Comparison of Total Oil Employment in 16 Southwestern Cities

City name	1993 total oil jobs	1993 percent of 29-city total	1987 total oil jobs	1987 percent of 29-city total
Houston	57,628	33.8	55,160	28.1
Dallas	16,979	10.0	18,626	9.5
Midland – Odessa	9,590	5.6	12,876	6.6
New Orleans	9,136	5.4	12,103	6.2
Lafayette	7,008	4.1	6,541	3.3
Fort Worth	5,106	3.0	5,721	2.9
Houma	2,623	1.5	4,257	2.2
Longview – Marshall	1,876	1.1	3,162	1.6
Shreveport	1,796	1.1	2,661	1.4
Corpus Christi	1,719	1.0	2,566	1.3
San Antonio	1,584	.9	2,582	1.3
Wichita Falls	1,429	.8	3,218	1.6
Abilene	1,301	.8	1,939	1.0
Tyler	1,019	.6	627	.3
Amarillo	550	.3	851	.4
Laredo	446	.3	369	.2
16 southwestern cities	119,790	70.3	133,259	67.9
Remaining 13 cities	50,593	29.7	63,096	32.1
All 29 oil cities	170,383	100.0	196,355	100.0

SOURCE: County Business Patterns.

**Table 4**  
Diversification Indexes for 16 Oil Cities in Texas and Louisiana

City name	Index	Made different by
Midland–Odessa	1,274	Oil and gas extraction
Houma	980	Oil and gas extraction
Lafayette	650	Oil and gas extraction
Laredo	232	Oil and gas extraction
Longview–Marshall	188	Oil and gas extraction
Abilene	185	Military
Corpus Christi	170	Oil refining
Amarillo	163	Oil and gas extraction
New Orleans	144	Oil and gas extraction
Wichita Falls	141	Military
Houston	119	Oil and gas extraction
Tyler	75	Oil and gas extraction
San Antonio	59	Federal military
Fort Worth	58	Transportation equipment, excluding automobiles
Shreveport	39	Oil and gas extraction
Dallas	29	Oil and gas extraction
16 southwestern oil cities	282	
13 other oil cities	117	
29 oil cities	208	

SOURCE: Bureau of Economic Analysis, Regional Economic Information System and author's calculations.

are rising. However, the industry still is not creating jobs, and continued job losses are concentrated among smaller oil centers. What does this mean for cities with large numbers of oil jobs? Or for broader regional growth trends? Our conclusion is that these Southwest oil cities *were* hurt by the massive industry correction of the oil bust, but they are now coping well with current job trends.

There is no question that oil shapes the industrial structure of these southwestern cities.<sup>3</sup> As seen in Table 4, oil is a large factor pulling the 16 Southwest oil cities away from a “typical” U.S. industrial structure. It is a mistake to conclude all these cities are simply built on oil, however. In each city, there is typically an industry other than oil extraction that can serve as a fallback when oil is hurt. Examples are transportation services in Laredo, chemicals in Houston and New Orleans, and the military in Abilene and Wichita Falls.

During the oil downturn, it was widely predicted that successful entrepreneurship would play a key role in the economic recovery of the Southwest. A forest-fire analogy

was often used; in other words, the layoffs of skilled technical people from oil and other industries were the seeds from which the next generation of companies and jobs would grow. The number of self-employed in the 16 oil cities in Texas and Louisiana grew twice as fast as it did in the United States from 1982 to 1987, while the income of the self-employed grew at half the rate it did in the United States. This turned around after 1987. From 1987 to 1993, the growth in the number of self-employed in the 16 cities slowed to a rate well below that of the United States, while entrepreneurial income grew at 80.5 percent versus 42.3 percent in the United States.

Now that the extensive adjustments required by the oil bust are well behind them, the regional oil cities have demonstrated they can grow without significant help from oil extraction. Despite continued dependence on oil, and oil's inability to create larger numbers of jobs, these cities collectively have shared in the Southwest's economic recovery. Taken together, their income and employment growth has exceeded that of the United States

since 1987. As was often predicted during the oil downturn, entrepreneurial income has become a powerful source of growth in virtually every oil city in Texas and Louisiana.

—Robert W. Gilmer

## Notes

- <sup>1</sup> The oil extraction industry consists of oil production, exploration, drilling and other services performed for producers, and the manufacture of specialized oil machinery.
- <sup>2</sup> For further detail on the source of the data and the actual figures, see “The Oil Industry and the Cities: Consolidation in the Oil Extraction Industry,” *Houston Business*, Federal Reserve Bank of Dallas, April 1996.
- <sup>3</sup> One way to illustrate how oil shapes industrial structure is to compute the following simple index that compares each city, industry-by-industry, to the United States. The United States, as a mix of all cities, provides a standard for a highly diversified place. The measure is zero if the city is highly diversified and matches the U.S. share in every industry; the index is large if the city has an industry mix that diverges far from the U.S. norm. A local concentration in any industry that is much larger than the U.S. will increase the index very quickly. The measure is

$$I = \sum_{i=1}^n \frac{(s_i - s_i^*)^2}{s_i^*} * 100,$$

where  $s_i$  is the share of wages, salaries and benefits paid in industry  $i$ ,  $s_i^*$  is the U.S. share of earnings in industry  $i$  and  $n$  is the number of industries. Table 4 shows the list of 16 southwestern oil cities, ranked from top to bottom according to their index value in 1987, or according to how different they are from the U.S. norm. Values and ranking in 1993 are very similar. Table 4 also shows the industry that contributed most to making each city different from the United States. Where oil and natural gas extraction is not the industry that makes a city most different, it ranks No. 2. As seen at the bottom of Table 4, the indexes for these 16 cities have an average value twice as big as the other 13 of 29 oil cities. For more details on this index and its application to 29 oil cities, see “Industrial Structure in Oil Cities,” *Houston Business*, Federal Reserve Bank of Dallas, May 1996.