

The Tenth District's Defining Industries: How Are They Changing?

By Chad R. Wilkerson and Megan D. Williams

The economy of the Tenth Federal Reserve District has become increasingly more services-based in recent years. While this transformation has lessened many of the historical differences with the rest of the nation, the regional economy still remains distinct, especially in some states. Wyoming, for instance, still has the most unique industrial structure in the country. And Nebraska, New Mexico, and Oklahoma still rank among the top third of states with economies that differ from the rest of the nation.

What industries make the Tenth District so different, and what can they tell us about the future of the regional economy?

This article examines the “defining” industries of the region. It finds that the performance of a relatively small group of these industries track closely with overall job growth in each state. In other words, states whose defining industries have prospered in recent years have grown quickly overall, while states whose defining industries have struggled have grown sluggishly. Thus, identifying a state’s defining industries and understanding

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how they are changing can provide vital context for policymakers seeking to improve prospects for growth—as well as help identify the types of economic shocks that might threaten the region in the future.

The first section of the article explains why defining industries are important to an economy. It also identifies the defining industries of the Tenth District. The second section looks at the recent performance and outlook of the region's key defining industries, focusing especially on those industries that are new or growing rapidly. The third section examines changes in the defining industries of individual district states, including new industries that are becoming significant.

I. DEFINING INDUSTRIES IN THE TENTH DISTRICT

Since 1970, the industrial structures of all seven Tenth District states have converged somewhat with that of the nation (Chart 1).¹ Still, several states' economies remain among the most unique in the country. Some of the industries that make the district different have done so for decades, while others are just emerging. Research is mixed on whether it is better for a state or local economy to become more diversified or to remain specialized in sectors where it has, or may acquire, a comparative advantage. In any event, defining industries seem to play a significant role in a state's growth over time.

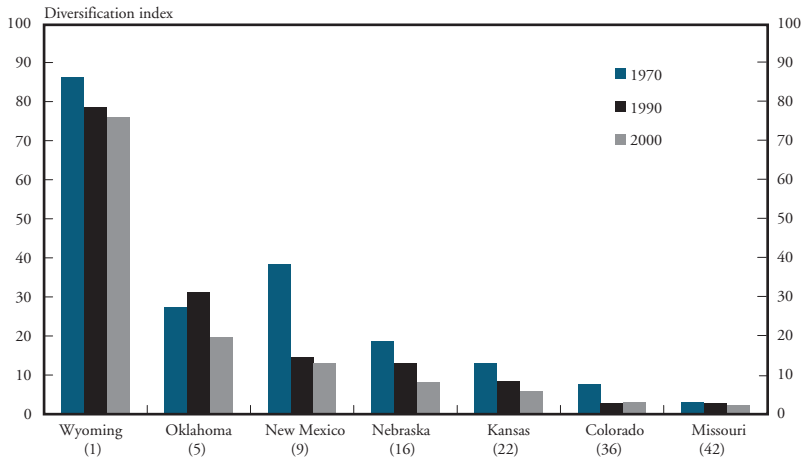
What are defining industries?

For an industry to be defining, it must be more concentrated in a specific region than in the nation. In this article, defining industries are limited to those with a location quotient of at least 1.25. A location quotient is the ratio of an industry's share of employment in the region relative to its share in the nation. A higher location quotient means a more defining industry and vice-versa.

Using this threshold helps distinguish defining industries from those often called "driving" industries, which may be large or add a significant number of jobs without being more important in the region than in the nation. Of course, defining industries may also be large, but not necessarily. A good example of an industry that is large and growing in many areas, but would likely not appear on a list of defining industries, is

Chart 1

TENTH DISTRICT STATES' DIFFERENCES FROM U.S. INDUSTRIAL STRUCTURE, 1970-2000



Note: Numbers in parentheses denote ranking of states' dissimilarity with the nation in 2000. Lower index numbers denote more similarity with the nation.

Source: Bureau of Economic Analysis

healthcare. Hospitals, doctors' offices, and ambulance services tend to be similarly concentrated throughout the country and so generally do not define a local area as different.

The second criterion used to identify defining industries in the Tenth District is that they account for at least 0.2 percent of employment in the region—over 25,000 jobs in 2005. This threshold narrows the group considered in the analysis to about 100 industries, most of which are neither large on a national scale nor particularly small.²

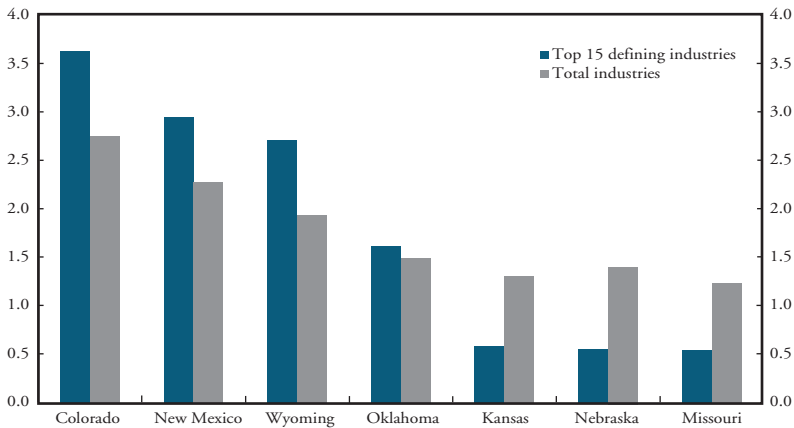
The two criteria selected for this analysis narrowed the size of the district's defining industries to a group of 15 industries. This small, but significant, group accounted for about 10 percent of total district employment in 2005.

Why are defining industries so important?

A number of academic studies show that industrial structure can explain much of the variation in state or metro area job growth rates. These results are especially robust when the studies account for industries similarly concentrated everywhere, such as those related to healthcare, retail, and real estate. While

Chart 2

AVERAGE ANNUAL STATE JOB GROWTH, 1990-2005(PERCENT)



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Railroad Retirement Board

varying performances by states can partly be explained by other, often interrelated, factors—such as an area’s cost of business, quality of life, trends in immigration, and worker productivity—much of the differences appear to be caused by unique industrial structures.³

Some studies claim that greater industrial diversity is important for growth (Jacobs; Glaeser and others; Coffey and Sheamur). Other studies suggest that greater industrial specialization leads to faster long-term growth (Porter; Penfold). Regardless of which strategy is best for future growth, each state and local area is specialized to a greater or lesser degree. And these specializations seem to help determine how an economy grows over time.

In the Tenth District, states that grew the fastest in their defining industries from 1990 to 2005 also grew the fastest overall among district states (Chart 2). Similarly, states that grew the slowest in their defining industries also grew the slowest overall in the district. Similar analysis for previous time periods and for subsets of years from 1990 to 2005 produce similar results—growth in relatively small groups of defining industries (generally accounting for approximately 10 percent of total employment) are highly correlated with overall job growth. As such, understanding what these industries are and how they are changing is vital for ascertaining the future prospects of the Tenth District economy.

Table 1

TOP 15 DEFINING INDUSTRIES IN THE TENTH DISTRICT, 2005

Rank	Industry Name	Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Primary States
1	Oil and gas extraction*	3.1	2.8	\$65,265	WY, OK, NM
2	Farm proprietors	2.2	2.2	\$8,311	OK, NE, KS
3	Animal slaughtering and processing	2.0	1.9	\$29,716	NE, KS, OK
4	Rail transportation	1.9	1.9	N/A	WY, NE, KS
5	Aerospace product and parts manufacturing	1.9	1.6**	\$69,313	KS, MO, CO
6	Wired telecommunications carriers	1.7	1.6	\$70,794	KS, CO, MO
7	Gambling industries	1.7	0.4	\$25,340	NM, OK, MO
8	Highway, street, and bridge construction	1.5	1.4	\$39,923	NM, WY, OK
9	Administration of environmental programs	1.5	1.6	\$46,300	WY, NM, CO
10	Business support services	1.4	1.5	\$27,111	NE, OK, NM
11	Data processing and related services	1.4	1.0	\$60,928	NE, MO, CO
12	Other general merchandise stores	1.4	1.1	\$18,715	All 7 states
13	National security and international affairs	1.3	1.4	\$55,928	OK, NM, WY
14	Specialized freight trucking	1.3	1.2	\$33,679	WY, MO, NE
15	Gasoline stations	1.3	1.3	\$16,147	WY, NM, NE

* Includes "support activities for mining" (NAICS 2131), which would rank no. 2 but is virtually the same industry on a contract basis.

** Does not include Colorado or Missouri, where information was not disclosed in 1990.

Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Railroad Retirement Board

Which industries now define the Tenth District?

The 15 defining industries of the Tenth District in 2005 are listed in Table 1. Given the relatively similar size of each of these industries at the national level, they are ranked by their 2005 location quotient. The table also includes each industry's location quotient in 1990, the earliest year for which comparable data are published. Thus, we are able to see whether an industry is becoming more or less concentrated in the region. The table also shows each industry's average annual pay in 2005 and where the industry is primarily located.

The number one defining industry in the Tenth District in 2005, as in 1990, was oil and gas extraction. Based on its location quotient, oil and gas extraction is about 3.1 times more concentrated in the region than in the nation, slightly more than in 1990. Oil and gas extraction in the region is most heavily concentrated in Wyoming, Oklahoma, and New Mexico, but it also has a sizable presence in Colorado and Kansas. The industry pays an average of more than \$65,000 a year, well above the overall district's average of about \$35,600.

Two other defining industries are at least twice as concentrated in the region than in the nation—farm proprietors and animal slaughtering and processing. Like oil and gas, these closely related industries have been highly defining industries in the region for quite some time. Farming is important relative to the nation in all district states but Colorado. Meat packing is most important in Oklahoma, Nebraska, and Kansas. Annual pay in these two industries is generally below average, especially in farming, which is often a part-time occupation.

The next three defining industries on the list—rail transportation, aerospace product and parts manufacturing, and wired telecommunications providers—have been highly concentrated in the district since at least 1990. Railroads still have a sizable presence in the northern part of the region, due in part to heavy and continual shipments of coal out of Wyoming to eastern parts of the nation. Aircraft manufacturing is most important in Wichita, Kansas, home to several sizable plants, while wired telecommunications carriers are centered primarily in the Kansas City and Denver metropolitan areas. Average pay in these industries is generally quite good.

Several other defining industries in the district have also been important since at least 1990. These include highway, street, and bridge construction; administration of environmental programs (including park and forest service, land management services, etc.); business support services (primarily call centers); national security and international affairs (largely civilian Department of Defense workers); specialized freight trucking; and gasoline stations. With the exception of national security, which pays quite well, and gasoline stations, which offer low pay, the average pay in these industries is typically close to the overall district average.

The three remaining defining industries are new to the list. Gambling, in particular, has become much more concentrated in the district, as new gaming legislation has been passed in several district states during the past 15 years. Data processing services have grown rapidly in the region since 1990, especially in Nebraska, Missouri, and Colorado. And “other general merchandise stores” (largely supercenters) have gained prominence in the region since 1990—in all seven district states. Pay for gambling and supercenters is generally below average, while average salaries in data processing exceeded \$60,000 in 2005.

Determining exactly why these 15 defining industries are located in the region would require considerable research in each case. However, several are likely tied to some of the region's unique characteristics: its abundance of certain natural resources (oil and gas, farming and meat packing, administration of environmental programs) its wide open geography and central location (highway construction, gas stations, rail and truck transportation); and its relatively low costs of doing business (call centers, data processing). These advantages of the region are unlikely to change soon, meaning many of the defining industries are likely to remain in the years ahead. As such, understanding the recent trends and outlook for important defining industries is vital to understanding the future performance of the district economy.

II. RECENT GROWTH AND OUTLOOK OF KEY DEFINING INDUSTRIES

The Tenth District's top six defining industries in 2005 were also its top six in 1990. Given the persistently high location quotients of these key industries, they are likely to remain vital to the region in the years ahead. Other defining industries have also grown rapidly and are likely to remain vital—call centers and each of the three new defining industries—gambling, data processing services, and supercenters.

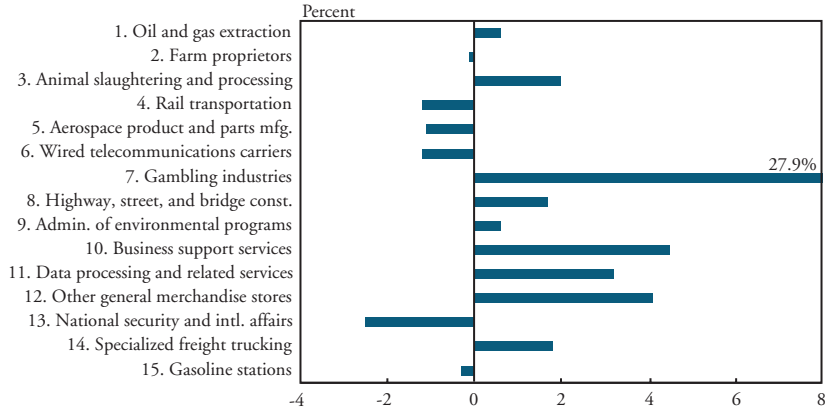
This section examines the recent employment trends and outlook for each of these key defining industries. For each industry, comparable employment data are readily available from 1990 to 2005. This period is especially revealing because it spans two recessions and one full expansion, allowing for industry analysis during the course of the business cycle. Projections of employment growth for each industry, along with explanations for the projections, are released every two years by the U.S. Bureau of Labor Statistics (BLS). These BLS projections, the latest of which were made in 2006 and span the years 2004–14, have generally proved to be reliable over time (Alpert and Auyer; Andreassen).⁴

Long-standing defining industries

Six industries have defined the Tenth District for decades, some of them for many decades. They include oil and gas extraction; farm proprietors; animal slaughtering and processing; rail transportation; aerospace product and parts manufacturing; and wired telecommunications carriers.

Chart 3

TOP 15 TENTH DISTRICT DEFINING INDUSTRIES AVERAGE ANNUAL JOB GROWTH, 1990-2005



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Railroad Retirement Board

The region's important *oil and gas extraction* industry experienced only modest job growth from 1990 to 2005—just over 0.5 percent annually (Chart 3).⁵ Its sluggishness during most of the period was driven by relatively low energy prices and lackluster prospects domestically. Since 2005, however, growth in the sector has been rapid due to rising energy prices. Employment in the natural resources and mining sector in the Tenth District, of which the oil and gas sector is a sizable part, grew more than 15 percent in 2006 and has continued its double-digit pace in the first half of 2007. Most analysts believe the outlook for the industry remains strong, as energy futures prices stay historically high, making domestic exploration profitable again.

Employment among *farm proprietors* in the Tenth District fell slightly from 1990 to 2005, continuing a century-long trend in the region. Advancements in technology have increasingly made it possible for fewer farmers and ranchers to produce greater amounts of output, a trend that is generally expected to continue. Greater global competition in agriculture should further limit job growth, although the opening of several markets for U.S. beef could slightly offset this trend. At the same time, the region's expertise in agriculture could open new opportunities in related fields, such as biofuels.

Employment in *animal slaughtering and processing* in the region has grown relatively solidly since 1990, averaging nearly 2 percent annually. The growth has been driven by rising demand for food products, particularly beef. The outlook for this industry is generally strong, with employment expected to rise as more meat products are consumed. In addition, jobs in this industry involve largely manual tasks that would be difficult to automate. Processing plants continue to grow larger but fewer in number—a development that has tended to concentrate employment in a few locations, including the Great Plains states of the Tenth District (Drabenstott and others).

Aircraft manufacturing in the region was hit hard in recent decades by defense cutbacks and the troubles of the airline industry after 9/11. Regional employment in the industry fell nearly 1 percent annually from 1990 to 2005. Still, the outlook for aircraft manufacturing is generally positive heading forward, largely due to recent increases in defense aerospace production and a rising trend in demand for civilian aircraft. Demand for personal air travel, in general, is likely to rise relative to other forms of transportation as real incomes rise, providing a boost to the many aircraft producers and suppliers in the region.

Rail transportation jobs have fallen in recent decades, as the industry has shed about 1 percent of its jobs annually since 1990. According to the BLS, the job losses have resulted largely from increased use of computers in tracking, dispatching, and monitoring trains. Rail transportation is likely to mirror the nation's overall economic growth in the years ahead, although employment gains could be hampered by further advances in technology.

Wired telecommunications providers in the region fell victim to the high-tech bust of 2000 and 2001. Like aircraft and rail, this sector shed jobs at about 1 percent annually from 1990 to 2005, although the bulk of the losses came in the latter part of the period. The BLS outlook for this industry is mostly weak, with the future of the telecommunications industry expected to center more on wireless, cable, and satellite. Industry consolidation and strong price competition among telecommunications firms are expected to cut jobs as well, while companies try to reduce costs.

Overall, recent growth in these six industries, which have defined the Tenth District for so long, has been sluggish at best. The outlook for some of them—most notably oil and gas and aircraft manufacturing—

has improved in the past couple of years. But overall these six traditional engines of growth are unlikely to create many jobs in the years ahead, meaning the region may need to look elsewhere for new jobs.

New and rapidly growing defining industries

Four defining industries in the Tenth District have stood out as strong providers of jobs since 1990, with each one exceeding 3 percent annual job growth. These key industries are gambling; business support services; data processing and related services; and other general merchandise stores.

Employment in *gambling industries* in the district rose from just a few hundred jobs in 1990 to more than 35,000 in 2005, and the rapid growth has continued in 2006 and 2007. The primary reason for such rapid expansion is new legislation allowing gambling in Oklahoma, Missouri, New Mexico, and Colorado. Strong employment growth in the industry is expected heading forward as well, spurred by new casinos on American Indian reservations and the introduction of slot machines at racetracks. Many states, including Kansas, are looking to relax gambling regulations, so they can increase state revenues from gaming establishment taxes.

The economic development benefits of gambling are often hotly debated. At one level, gambling can be viewed primarily as just another means of entertainment. That is, money spent in casinos is largely money that otherwise would have likely gone to other forms of local entertainment, like sporting events or movies. If true, gambling would boost a local economy only if it brings in nonresidents, or tourists. Attracting tourists can be good for a local area, obviously, but perhaps not for the areas whose residents now travel elsewhere to spend their entertainment money. So, whether gambling is good for an economy depends on the point of reference. That is, an area with a casino likely prospers primarily at the expense of other areas or other types of entertainment.

An added factor in the trend toward more gambling is the increase in social costs that could potentially arise—costs such as rising crime and higher personal bankruptcy rates. Analysts have found that such costs can be sizable. For example, Grinols found that casino gambling causes up to \$289 in social costs for every \$46 of economic benefit. Goss and Morse found a 2.3 percent difference in growth rates of bankruptcy from 1990 to 1999 between counties with casinos and those

without. Edmiston found a statistically and economically significant relationship between distance to the nearest casino and county bankruptcy filing rates.

Business support services, or primarily call centers, has been a defining industry in the district at least since 1990, posting a location quotient of about 1.5 both then and in 2005. But unlike most other long-standing defining industries, it has continued to grow quickly and to concentrate in the region. The reasons most often cited by companies for choosing the region are its low costs of business and the plain talk of Midwesterners, which can be understood easily by a wide variety of English speakers. This language factor is also often cited as a reason why not as many of the industry's businesses have moved offshore as originally expected, and why some may actually be moving back onshore.

The outlook for the business support industry is generally favorable, with output expected to grow rapidly and productivity expected to increase at a slightly slower rate, boosting employment. Call centers generally do not pay particularly high wages, but the industry tends to perform relatively well throughout the business cycle, unlike several other defining industries. Call centers can also present solid job opportunities for many rural areas suffering from loss of agricultural and other jobs, as this type of work can be performed virtually anywhere (Gillespie and Richardson).

Another new defining industry in the region is *other general merchandise stores*, or largely retail superstores such as Wal-Mart supercenters and Super Targets. Such stores are now more concentrated in all seven states of the Tenth District than in the nation as a whole. The outlook for employment growth in the industry is generally solid, according to the BLS, although limited somewhat by increased emphasis on self-service.

Whether supercenters are desirable for communities continues to be debated across the country. These stores generally offer low prices and large selections, which benefit consumers, but they also can displace locally owned retail stores. A number of economic studies in recent years have analyzed the costs and benefits of such stores for local areas. Basker (2005) finds very little effect of the entry of a Wal-Mart store on local employment, although the number of retail establishments in an area

generally falls. Artz and Stone (2006) analyze areas where Wal-Mart supercenters opened from 1990 to 2005 and find a significant negative effect on rural grocery store sales, but less harm in metropolitan counties.

Also new to the list of defining industries in the district is *data processing and related services*, or back-office high-tech operations that employ large numbers of computer specialists and analysts. Unlike the other three rapidly growing defining industries, data processing pays relatively high wages—with annual pay in the district exceeding \$60,000 in 2005. The outlook for the industry is also quite strong. Both data hosting services and data processing centers are expected to experience future employment growth as the result of the continued need to input paper records into computer files and to convert older, archived data to newer formats.

Across the nation, data processing firms tend to locate most heavily in midsized metropolitan areas, where highly skilled workers are generally available, but business costs are often lower than in larger cities (Wilkerson 2002). The Tenth District is heavily concentrated in cities of this size, which may help explain the industry's sizable presence in the region. Like call centers, the type of work done at these businesses can typically be performed in remote locations, provided a telecommunications infrastructure and qualified workers are available. For example, Google, Inc. recently announced it would open a data center in Pryor, Oklahoma, a community about 50 miles from Tulsa with less than 10,000 people.

In sum, the recent rapid growth of these four Tenth District defining industries is generally expected to continue, although perhaps at a less-frenzied pace. While the outlook for growth in these industries is generally good, disputes about the desirability of expansion of gambling and supercenters, in particular, suggest some areas may look to other emerging industries as sources of future potential job growth. Call center and data processing work, however, may present opportunities for some rural areas.

III. DEFINING INDUSTRIES IN INDIVIDUAL DISTRICT STATES

The Tenth District's top 15 defining industries are, not surprisingly, often defining industries in individual district states. The industries that define specific states vary widely, however, as do the recent changes and growth in these industries (Table 2). Thus, future economic shocks—and future opportunities—in district states could come from differing sources. In particular, new defining industries that have emerged in several states may serve as anchors for the future.

Colorado

Colorado's top defining industries are high-tech ones—software, computer manufacturing, and wired telecommunications. Another high-tech industry—computer systems design—also ranks highly. In addition, Colorado's list contains several industries related to housing, perhaps reflecting in part the second home market in the state and the rise of alternative home financing in some large cities such as Denver. Activities related to credit intermediation, number seven on the list, are primarily mortgage lenders and brokers. Given these concentrations, any future shocks to the Colorado economy are likely to come via the high-tech and housing markets.

Most of Colorado's defining industries are growing rapidly and pay well. All but four have added jobs at a faster pace than 2 percent annually since 1990, and two have posted double-digit annual growth. In addition, many of the state's defining industries are relatively new, with their location quotients rising since 1990. This is especially true of the software and air transportation industries, which should continue to define and drive the state in the years ahead, as well as several of the housing-related sectors, whose outcomes could be more uncertain given recent housing difficulties in the state.

Table 2

TOP 15 DEFINING INDUSTRIES IN TENTH DISTRICT STATES

Colorado		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	Software publishers	3.1	1.6	\$91,973	11.3
2	Computer and peripheral equipment mfg.	2.3	3.0	\$107,626	-3.3
3	Wired telecommunications carriers	2.2	2.0	\$82,508	-.4
4	Oil and gas extraction	1.9	2.0	\$93,069	.5
5	Administration of environmental programs	1.9	2.9	\$61,391	-.7
6	Other support services	1.8	1.5	\$43,326	4.5
7	Activities related to credit intermediation	1.8	1.3	\$54,003	11.6
8	Computer systems design and related	1.7	1.6	\$80,491	7.4
9	Scheduled air transportation	1.6	1.2	\$44,990	2.7
10	Architectural and engineering services	1.6	1.4	\$69,008	4.3
11	Other specialty trade contractors	1.6	1.0	\$36,277	7.1
12	Sporting goods and musical instruments	1.5	1.6	\$17,392	2.3
13	Activities related to real estate	1.5	1.7	\$39,582	3.2
14	Executive, legislative, and general government	1.4	1.1	\$41,528	3.9
15	Other financial investment activities	1.4	N/A	\$111,621	N/A

Kansas		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	Aerospace product and parts manufacturing	7.8	4.6	\$61,958	-.7
2	Farm product raw material merch.	7.0	7.0	\$29,934	-1.3
3	Cattle ranching and farming	3.8	3.9	\$30,608	3.0
4	Animal slaughtering and processing	3.6	3.3	\$31,822	1.7
5	Wired telecommunications carriers	3.6	1.5	\$77,607	3.6
6	Ag., construction, and mining machinery	3.1	2.8	\$39,227	.3
7	Farm proprietors	3.0	3.0	\$9,548	-.6
8	Rail transportation	2.4	2.8	N/A	-2.8
9	Office administrative services	2.4	1.7	\$48,123	7.4
10	Medical and diagnostic laboratories	2.0	0.6	\$47,822	10.3
11	Oil and gas extraction	1.8	2.1	\$44,915	-1.5
12	Executive, legislative, and general government	1.7	1.6	\$30,536	1.3
13	Printing and related support activities	1.6	1.2	\$37,613	.2
14	Community care facilities for the elderly	1.6	1.7	\$18,586	3.8
15	Machinery and supply merchant wholesalers	1.5	1.3	\$42,485	1.0

Missouri		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	HVAC and commercial refrigeration equipment	2.9	1.6	\$34,153	3.6
2	Motor vehicle manufacturing	2.8	3.0	\$80,734	-.9
3	Farm proprietors	2.5	2.4	\$2,960	-.3
4	Electrical equipment manufacturing	2.2	2.2	\$45,077	-3.1
5	Data processing and related services	2.1	1.0	\$59,772	5.2
6	Gambling industries	2.0	N/A	\$27,829	N/A
7	Management of companies and enterprises	1.9	2.1	\$76,121	2.8
8	School and employee bus transportation	1.7	1.9	\$17,145	2.5
9	Highway, street, and bridge construction	1.7	1.5	\$39,680	1.2

Table 2 cont.

Missouri cont.		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
10	Aerospace product and parts manufacturing	1.7	N/A	\$81,340	N/A
11	Other fabricated metal product manufacturing	1.6	1.6	\$48,401	-1.9
12	Specialized freight trucking	1.5	1.4	\$40,816	1.7
13	Rail transportation	1.5	1.5	N/A	-1.7
14	Wired telecommunications carriers	1.5	1.9	\$62,200	-4.0
15	Motor vehicle and parts merchants	1.5	1.4	\$37,152	1.4

Nebraska		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	Farm product raw material merch.	9.2	7.4	\$29,739	.3
2	Animal slaughtering and processing	7.2	6.6	\$30,661	1.7
3	Rail transportation	6.7	4.9	N/A	.4
4	Cattle ranching and farming	4.7	5.1	\$27,761	2.7
5	Ag., construction, and mining machinery	4.2	3.5	\$41,210	1.1
6	Data processing and related services	3.4	3.6	\$64,364	.3
7	General freight trucking	3.3	1.8	\$35,496	5.1
8	Farm proprietors	3.2	3.6	\$20,764	-1.3
9	Electronic shopping and mail-order houses	2.4	1.8	\$24,270	4.3
10	Business support services	2.4	4.3	\$30,406	.3
11	Rubber product manufacturing	2.0	2.3	\$43,867	-2.1
12	Misc. nondurable goods merchant wholesalers	2.0	2.4	\$34,560	.1
13	Insurance carriers	2.0	1.7	\$49,635	.9
14	Other residential care facilities	1.9	2.2	\$31,177	2.0
15	Power generation and supply	1.9	1.4	\$61,736	-4

New Mexico		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	Cattle ranching and farming	7.4	5.1	\$23,520	6.8
2	Oil and gas extraction	6.2	4.5	\$53,550	2.6
3	Facilities support services	5.4	N/A	\$40,012	N/A
4	Gambling industries	4.4	.6	\$25,601	31.9
5	Scientific research and development services	3.8	4.7	\$71,710	.4
6	Administration of environmental programs	3.1	3.0	\$50,062	1.7
7	Outpatient care centers	2.6	1.6	\$42,366	8.0
8	Semiconductor and electronic component mfg.	2.5	1.4	\$66,857	3.2
9	Highway, street, and bridge construction	2.1	2.4	\$33,761	.7
10	Wireless telecommunications carriers	2.1	1.0	\$36,491	17.0
11	National security and international affairs	2.0	2.3	\$61,237	-2.6
12	Medical and diagnostic laboratories	1.9	1.3	\$45,975	6.2
13	Support activities for crop production	1.9	3.1	\$10,983	-1.5
14	Drinking places, alcoholic beverages	1.8	2.6	\$12,895	-2.5
15	Individual and family services	1.8	1.4	\$21,104	7.5

Oklahoma		Location Quotient, 2005	Location Quotient, 1990	Average Annual Pay, 2005	Average Annual Job Growth, 1990-2005
Rank	Industry Name				
1	Oil and gas extraction	8.2	8.5	\$66,972	-5
2	Technical and trade schools	4.5	4.0	\$33,924	1.9

Table 2 cont.

Oklahoma cont.		Location	Location	Average	Average Annual
Rank	Industry Name	Quotient, 2005	Quotient, 1990	Annual Pay, 2005	Job Growth, 1990-2005
3	Rubber product manufacturing	3.4	2.9	\$52,368	-.2
4	Gambling industries	3.4	1.0	\$21,335	24.4
5	Farm proprietors	3.3	2.7	\$5,559	1.0
6	Ag., construction, and mining machinery	3.3	3.0	\$44,354	.5
7	National security and international affairs	3.3	2.6	\$54,701	-.8
8	Automotive equipment rental and leasing	2.9	2.3	\$43,266	2.7
9	HVAC and commercial refrigeration equipment	2.7	1.9	\$39,261	1.9
10	Other general purpose machinery manufacturing	2.3	1.7	\$50,167	.1
11	Motor vehicle body and trailer	2.0	2.4	\$28,365	.7
12	Business support services	2.0	.8	\$25,838	10.8
13	Animal slaughtering and processing	1.9	.9	\$27,596	6.6
14	Administration of human resource programs	1.9	1.7	\$36,318	1.3
15	Other general merchandise stores	1.8	1.7	\$17,636	2.9
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Wyoming		Location	Location	Average	Average Annual
Rank	Industry Name	Quotient, 2005	Quotient, 1990	Annual Pay, 2005	Job Growth, 1990-2005
1	Coal mining	32.5	17.0	\$69,454	.9
2	Oil and gas extraction	20.6	12.3	\$59,112	3.7
3	Nonmetallic mineral mining and quarrying	11.5	11.4	\$63,495	.0
4	RV parks and recreational camps	7.2	7.1	\$18,421	3.0
5	Rail transportation	6.0	4.9	N/A	.2
6	Cattle ranching and farming	5.3	6.5	\$24,523	2.4
7	Administration of environmental programs	5.2	5.9	\$43,253	.4
8	Utility system construction	4.1	2.9	\$44,592	4.2
9	Petroleum and coal products manufacturing	3.9	2.9	\$62,252	.3
10	Machinery and equipment rental	3.8	1.7	\$54,392	7.1
11	Basic chemical manufacturing	3.0	N/A	\$70,752	N/A
12	Commercial machinery repair and maintenance	2.8	1.7	\$42,681	5.9
13	Other residential care facilities	2.8	1.0	\$23,460	11.0
14	Administration of economic programs	2.8	1.1	\$38,565	6.8
15	Traveler accommodation	2.7	2.4	\$17,491	2.3

Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Railroad Retirement Board

Kansas

The top defining industry in Kansas is aircraft manufacturing, centered in Wichita. Also ranking highly are several agriculture-related industries, along with wired telecommunications. Given the especially high location quotients of these industries (over 3.5 in each case), future differences in growth between the Kansas economy and the national economy are still likely to be driven by trends in aircraft, agriculture, and telecommunications. As a result, it will be vital for the state to stay on the cutting edge of technologies and opportunities in these fields.

However, the fastest-growing defining industries in Kansas are office administrative services, which are largely back-office recordkeeping and logistics arrangement on a contract basis, and medical and diagnostic laboratories, or the biosciences industry. Both industries pay relatively high wages and are expected to grow rapidly in the years ahead. As such, they could potentially serve as anchors for the state economy heading forward. Another rapidly growing industry is care facilities for the elderly, reflecting the aging population in Kansas, especially in rural areas.

Missouri

In Missouri, the district state whose industrial structure most resembles the nation, durable manufacturing industries stand out on the list. The state's top two defining industries are HVAC and motor vehicle manufacturing, respectively, and three other durable goods industries also rank among the state's top 15. Farming continues to be important, listed at number three, but differences in the performance of Missouri's economy from that of the nation are still likely to be driven primarily by durable manufacturing trends. This would ensure that manufacturing in the state is poised to take advantage of future opportunities is vital.

The fastest-growing defining industry in the state is data processing, which has become highly concentrated in Missouri in recent years. Given its positive outlook and high wages, the state could potentially benefit further from this sector. No growth rate is shown for gambling industries in the state because employment was zero in 1990, but as of 2005 there were over 11,000 jobs in the industry. Another of the state's solid-growth industries that pays relatively high wages is specialty freight trucking.

Nebraska

In Nebraska, the top defining industry is farm product wholesalers, consisting primarily of grain elevators. The industry is over nine times as concentrated in the state as in the nation. A number of other agriculture-related industries are also high up on the list, suggesting that future shocks to the state's economy are still likely to come primarily through this sector. In 2006 and 2007, Nebraska's high agriculture concentration has served it well, as the ethanol boom has boosted farm incomes and land values. However, risks remain from overconcentration in one sector, as well as in the ethanol business more specifically (Novack and Henderson).

The defining industries of Nebraska have changed very little during the past 15 years—that is, most of these industries were also among the state’s top 15 defining industries back in 1990. And most of Nebraska’s defining industries have grown quite slowly. The three biggest exceptions, or those that have grown faster than 2 percent annually, are cattle ranching, trucking, and electronic shopping houses. Each of these could provide solid future growth opportunities in various locations across the state.

New Mexico

New Mexico’s top defining industry is cattle ranching, followed by oil and gas extraction and facilities support services (primarily for government institutions). All three of these industries are more than five times as concentrated in the state than in the nation. The Los Alamos and Sandia National Laboratories also cause scientific R&D activity to rank fifth in the state. Future shocks to New Mexico’s economy relative to the nation, therefore, are likely to come from the agriculture, energy, or government sectors, which could pose some risk, given frequent swings in activity in these sectors.

In general, New Mexico’s defining industries have grown solidly since 1990. Gambling and wireless telecommunications have grown rapidly, as have a couple of social services industries. Another industry that has achieved critical mass and pays relatively well is medical and diagnostic laboratories, or biosciences. Thus, this industry could potentially serve as an anchor for the state heading forward, given the projections for its strong job growth in the years ahead.

Oklahoma

In Oklahoma, the top defining industry by far remains oil and gas extraction, which is over eight times as concentrated in the state as in the nation. Ranking second is technical and trade schools, an industry that Oklahoma policymakers have made a priority in recent years, and which should bode well, given the projections for strong growth of jobs requiring vocational awards or associate degrees in coming years (Wilkerson and Williams). Several manufacturing industries also rank highly, as do farm proprietors. Nevertheless, despite some diversification in the state’s

economy in recent decades, economic shocks in the state are still likely to be driven primarily by energy. In 2006 and 2007, a booming oil and gas sector has boosted the state overall, and strong futures prices suggest the good times could continue. However, relying heavily on one particular sector has its risks.

The four defining industries growing the fastest in Oklahoma since 1990 have also posted strong growth in the Tenth District: gambling, call centers, meat packing, and other general merchandise stores. Salaries in these industries are not particularly high, but employment tends to be more stable over long periods than in some of the defining industries that rank higher on the list, such as oil and gas and manufacturing.

Wyoming

Wyoming's industrial structure resembles that of the nation less than any other state. Its defining industries are primarily natural resources industries or those that are closely related, such as railroads or machinery rental and repair, which have generally done well recently. Also included on Wyoming's list are a couple of tourism industries and some government-related industries. Future shocks in these industries could pose risks to the state, given the frequent volatility in these sectors. Still, strong expectations for oil and gas in the years ahead could continue to benefit the state.

Most defining industries in Wyoming have performed well since 1990. Oil and gas extraction has posted annual job growth of just under 4 percent, and tourism industries have also posted moderate growth. Another intriguing industry on the list is administration of economic programs, as the state is actively trying to determine ways to establish economic bases other than natural resources that might prove to be less volatile and have greater long-run prospects.

IV. SUMMARY AND CONCLUSIONS

As the economy of the Tenth Federal Reserve District has changed in recent decades, it has come to look somewhat more like the nation. Yet it remains more distinct than most other parts of the country. This article finds that industries that make a region or state different from the

nation—defining industries—tend to drive overall differences in growth. Changes in the energy, agriculture, railroad, aircraft manufacturing, and telecommunications sectors, in particular—industries that have traditionally defined the region’s economy—are likely to keep the region’s economic growth different from that of the nation. At the same time, new industries such as gambling, call centers, supercenter retailers, and data processing are increasingly defining the region and are worthy of attention.

At the individual state level, recent overall employment growth has closely mirrored growth in each state’s defining industries. Recognizing those industries that define a state, how they are doing, and what the upside and downside risks of each industry are, can provide vital context for policymakers seeking to improve growth prospects in their area. Most district states maintain a high presence in the energy or agriculture sectors, or both, and so staying on the cutting edge of trends in these industries could present opportunities, such as the recent success of bio-fuels. This is especially true in those states most reliant on these industries—Nebraska, Oklahoma, and Wyoming.

Finally, a few industries are also emerging as significant in specific states and may prove to be anchors for the future, given a positive overall outlook and high average pay for the industries. For example, the software industry has become highly concentrated in Colorado; the data processing industry is increasingly important in Missouri; and medical and diagnostic laboratories are growing rapidly in Kansas and New Mexico. While focusing too much attention on individual industries can pose risks, the critical mass these industries have reached in some states may present opportunities.

ENDNOTES

¹The Tenth Federal Reserve District includes the entire states of Colorado, Kansas, Nebraska, Oklahoma, and Wyoming, plus the northern half of New Mexico and western third of Missouri.

²A number of methods and data sources could be used to determine which industries now define the Tenth District. Considerations include: whether to base location quotients on employment, output, or another measure; the desired level of industry detail; the breadth of industries available in a data source; the freshness of the data; and the availability of comparable historical data from which to analyze trends. In order to give a broad and up-to-date level of industry detail at the state level, the primary data source used in this article is state employment data at the four-digit NAICS level. These data are available on an annual basis through 2005, and comparable historical data back to 1990 were also recently made available. (Additional historical data could also be constructed by converting SIC data to NAICS data.) Over 98 percent of these data are disclosed for states in the Tenth District, providing details for over 300 industries. By contrast, state output and other data are generally not available at such a detailed level on a timely basis. In addition, employment measures are generally more likely to appeal to a broader audience.

³For example, Bound and Holzer found industrial structure explained about 20 percent of the differences in U.S. metro area job growth rates during the 1980s. Wilkerson (2005) had a similar finding for U.S. states during the 1990s. In addition, several other studies have found that areas with favorable industrial structures tend to grow even faster than the overall industrial structure would predict, suggesting that spillover growth from an area's most defining industries may drive growth in "local" industries more than overall national trends in these industries (Garcia-Mila and McGuire; Partridge and Rickman).

⁴For a recent analysis of what would happen to Tenth District state economies if their industries grew at the same rate as is expected at the national level in the years ahead, see Wilkerson (2005). Industry outlooks in this section draw heavily from those made in the latest BLS *Career Guide to Industries* (2007).

⁵Oil and gas extraction (NAICS 2111) in this article also includes support activities for mining (NAICS 2131), which would rank no. 2 overall among defining industries but is virtually the same industry on a contract basis.

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