

# Changes in Tenth District Industrial Structure, 1963-86: Evidence from New State Data

By Glenn H. Miller, Jr.

New data on state output by industry show that the industrial structures of the U.S. economy and the Tenth District economy differ significantly. The chief difference between the two economies is the greater importance of agriculture and mining in the district economy. While the industrial structures of the two economies remain quite different, the district economy has undergone some significant changes in industrial structure in recent decades. Among the most important changes are the reduced role of mining and the increased role of manufacturing in district economic activity. Thus, by the mid-1980s the district economy was becoming more like the national economy.

Until recently, studies of regional economies have suffered from data limitations. Studies of economic growth and industrial

structure in states or in multistate regions have depended mainly on employment and personal income data, the principal data available at the subnational level. In contrast, studies of the national economy have generally used total output data, such as GNP, in discussing economic growth, and data on output by industry in analyzing changes in industrial structure. Similar output data have not been available for states. Due to the lack of such output data, studies of regional economies have yielded only limited results.

New data were released last year that correct this deficiency in regional data availability and make regional output studies possible. The Commerce Department's Bureau of Economic Analysis (BEA) published annual estimates of gross state product (GSP) by industry for each state for the period from 1963 to 1986.<sup>1</sup> With the new GSP estimates, researchers and policy-

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Glenn H. Miller, Jr. is a vice president and economic advisor at the Federal Reserve Bank of Kansas City. Julie Stanley, a research associate at the bank, assisted in the preparation of this article.

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<sup>1</sup> Construction of the GSP estimates is discussed briefly in the appendix to this article.

makers can now compare consistent output estimates for all states. These estimates are more comprehensive than traditional measures and may be more appropriate measures of economic growth and change at the state level.

This article points out the benefits of the new GSP estimates in comparison with traditional regional indicators and then uses the GSP data to examine changes from 1963 to 1986 in industrial structure in the Tenth District. The article concludes that the importance of agriculture and mining still distinguish the district economy from the nation's, although strong growth in manufacturing and a decline in mining have made the district more like the United States as a whole.

The first section of the article explores the uses of the new GSP data for regional analysis and suggests the data will be most useful for studying long-run growth trends and long-run changes in industrial structure. The second section discusses industrial change in the context of district growth and shows both the continued importance of district resource-based industries and the increasing importance of manufacturing in the Tenth District.

## **I. GROSS STATE PRODUCT: BENEFITS AND USES**

The GSP estimates offer observers of regional economies both benefits and shortcomings. The estimates serve well as indicators of regional economic activity due to their comprehensiveness and consistency across states. The data do have shortcomings of timing and timeliness. On balance, though, the GSP estimates are potentially quite useful for studying long-run growth trends and long-run changes in industrial structure.

## **Benefits**

One benefit of the BEA estimates of GSP is that the published measures are regarded as official estimates. As a result, the BEA estimates are soon likely to take precedence over various unofficial estimates of GSP, based on estimation approaches that have existed for 20 years or more. Because unofficial estimates have been made by university economists and others for a variety of purposes, those estimates are not necessarily comparable across states. Thus, another significant benefit of the BEA's estimates is their comparability among all states. Furthermore, because unofficial estimates of GSP are often "blow-up" approximations based primarily on earnings data, they lack the comprehensiveness made possible by BEA's incorporating state estimates of indirect business tax liabilities and capital charges.<sup>2</sup>

The GSP estimates also compare favorably with other official data series used as indicators of state and regional economic activity, such as employment and personal income. The GSP estimates compare favorably because, unlike the employment and income data, the GSP data represent comprehensive output measures, both in the aggregate and by industry.

GSP is a more comprehensive indicator of economic activity than is total personal income, because GSP includes estimates of all capital charges, indirect business tax liabilities, labor compensation, and proprietors' income. Indirect tax liabilities and some capital charges are excluded from personal income estimates. Total personal income, on the other hand,

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<sup>2</sup> For a discussion of the official estimates, see Renshaw and others 1988. For an evaluation of the BEA data, including comparisons with other data on state economic activity, see Giese 1989.

includes income from sources other than returns received for services used in current production. Moreover, within the personal income data set, only earnings data (labor compensation plus proprietors' income) are available by industry and by state. Using these narrower series to analyze industrial structure changes at the state or regional level can lead to serious distortions when other components of total output vary substantially (Renshaw and others 1988).

The GSP data also have advantages over employment data. While employment data are comprehensive in their coverage of nonfarm economic activity, they omit the farm sector and also have other shortcomings in comparison with GSP. Employment data measure just one input to the productive process. Because the employment data do not include hours worked, they do not provide a complete measure of the labor input. Moreover, employment data are not always a sufficient indicator of economic activity, as evidenced by the contrasting behavior of employment and output in the manufacturing sector. From 1963 to 1986, for example, manufacturing employment in the United States increased less than 1 percent per year, while U.S. manufacturing output as shown in the GSP estimates increased more than 3 percent per year.

### **Comparing GSP and employment indicators**

Using the GSP data to study economic growth and industrial change in the Tenth District yields a number of conclusions different from those suggested by using the nonagricultural payroll employment data. Three main differences result from using the two indicators.

The first difference concerns overall

growth in economic activity. Nonfarm employment in the district grew slightly faster on average than U.S. nonfarm employment from 1963 to 1986. The GSP data, however, show that the district economy, including the farm sector, grew more slowly than the national economy during that period. As a result, the district contribution to U.S. total output was slightly smaller in 1986 than in 1963.

The second difference concerns the performance of the agricultural sector. District growth in agricultural GSP was considerably faster on average from 1963 to 1986 than national agricultural growth. Consequently, district agriculture contributed a significantly larger share of U.S. agricultural output in 1986 than in 1963. The employment data are necessarily silent on these matters, because they include only nonagricultural payrolls.

The third difference concerns the performance of the district mining sector. The employment data suggest little change in the relative position of the district mining sector from 1963 to 1986. The GSP data, however, show a significant weakening in district mining activity. The GSP data show district mining output declining on average from 1963 to 1986, compared with slow growth in national mining output. As a consequence, the district contribution to U.S. mining output was substantially smaller in 1986 than in 1963.

The GSP and employment indicators essentially agree on the performance of the manufacturing sector. District manufacturing output and employment both grew substantially faster than U.S. manufacturing and employment from 1963 to 1986, and a significant increase in the district share of national manufacturing activity is evident in both the GSP and the employment data.

## Shortcomings and uses

While the GSP estimates are both comprehensive and comparable output measures, they suffer from problems of both timing and timeliness. With regard to timing, only annual estimates of GSP are published. Because quarterly or monthly data are important for analyzing business cycles, GSP data may contribute little to regional business cycle studies. With regard to timeliness, the reporting lag for GSP data is quite long. Data for 1986 were not published until mid-1988, and future reporting lags are likely to be at least as long. Reporting lags of such length greatly lessen the usefulness of GSP data for current analysis and forecasting purposes (Schmidt and Loseke 1989).

In spite of these weaknesses, the GSP data are useful in analyzing long-run growth trends and long-run changes in industrial structure. Such analysis is not simply of historical interest. Regional economists are aware that economic growth is an evolutionary process, and that decisions and developments of the past greatly influence current developments and future possibilities (Perloff and others 1960, p. vi). As a result, understanding past regional growth patterns is a necessary foundation for understanding economic activity both now and in the future. Regional economists also recognize the importance of long-run changes in industrial structure for forward-looking analysis.

As the various industries within a given region expand or decline or change in nature, the consequence for the region is not merely the sum total of these individual industry changes. What evolves is a total pattern of economic development which is itself a significant force in future changes (Perloff and others 1960, p. 486).

## II. TENTH DISTRICT GROWTH AND INDUSTRIAL CHANGE

Long-run changes in industrial structure and differences in industry growth rates are at the heart of the evolutionary process of regional economic growth and development. Thus, understanding fundamental economic change in the Tenth District requires the examination of specific economic activities at the industry level. Differences in growth rates by industry—for example, weakness in mining and strength in manufacturing—have heavily influenced industrial change in the district. Moreover, because the overall performance of the district economy comprises all its various industry changes, the pace of district total output growth reflects the ebbs and flows in the district's individual industries. This section discusses changes in district industrial structure, emphasizing the importance of agriculture, mining, and manufacturing. The section then briefly reviews growth trends in total output in light of growth performance by industry.

### Overview of industrial change

Industrial change in the Tenth District, both in terms of changes in the district's industrial structure and in terms of the district's contribution to U.S. output, is influenced heavily by differences in growth rates by industry.<sup>3</sup>

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<sup>3</sup> Industrial structure is characterized according to the contributions of individual industries to total output. An industry's contribution to a state's total output as measured by its GSP is called the gross product originating in that industry. An industry's gross product originating—also called its value added—may be defined in two equivalent ways. It

*Changes in industrial structure.* In both 1963 and 1986, the industrial structures of the district and U.S. economies differed in much the same way. In both years, agriculture, mining, and transportation contributed more to district total output than to U.S. total output (Chart 1).

While the importance of resource-based industries remains the major difference between the district and the United States as a whole, the two have also grown somewhat more alike in industrial structure. In 1986, the same four industries were the primary contributors to both Tenth District and national total output: manufacturing, services, FIRE (finance, insurance, and real estate), and government (Chart 1). The major change in district industrial structure from 1963 to 1986 was the disappearance of mining from the list of the district's four largest industries, as shown by share of total district GSP. Strong growth in district manufacturing and weakness in the district mining sector resulted in the displacement of mining by manufacturing as the industry contributing most to district total GSP.

*Share of U.S. output.* Changes in the district's growth rates and industrial structure alter the district's contribution to national output, both in total and by industry. From 1963 to 1986, the district's contribution to total U.S. output changed only slightly (Table 1). In 1963, district states produced 7.5 percent of total U.S. output. In 1986, after nearly 25 years of district

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equals the sum of the industry's factor payments and non-factor costs, just as it is shown in the appendix that GNP measured on the income side equals the sum of factor charges and nonfactor charges against GNP (left side of Table A-4). An industry's gross product originating also may be defined as the total value of its output (sales plus inventory change) less the value of its consumption of purchased materials and services inputs.

TABLE 1  
**Tenth District real GSP as a share of U.S. real GSP, by industry, 1963 and 1986 (percent)**

<u>Industry</u>	<u>1963</u>	<u>1986</u>
Total	7.5	7.2
Agriculture	11.9	13.7
Mining	20.4	15.2
Construction	7.4	7.4
Manufacturing	4.6	5.7
Transportation	8.2	8.5
Wholesale trade	6.7	6.4
Retail trade	7.2	7.1
FIRE	7.0	6.6
Services	6.3	6.3
Government	7.3	7.6

**Addendum: Total output  
valued in billions of 1982 dollars**

United States	1,863	3,681
Tenth District	140	264

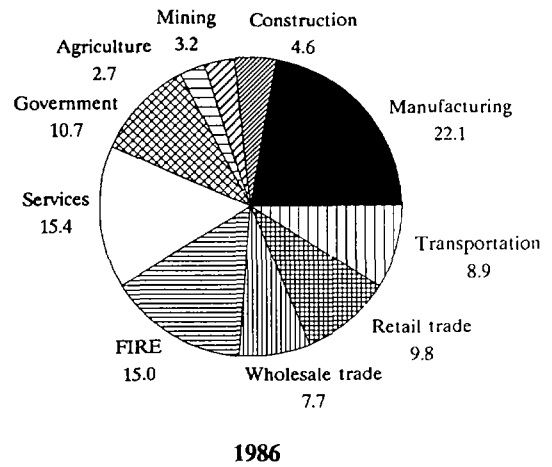
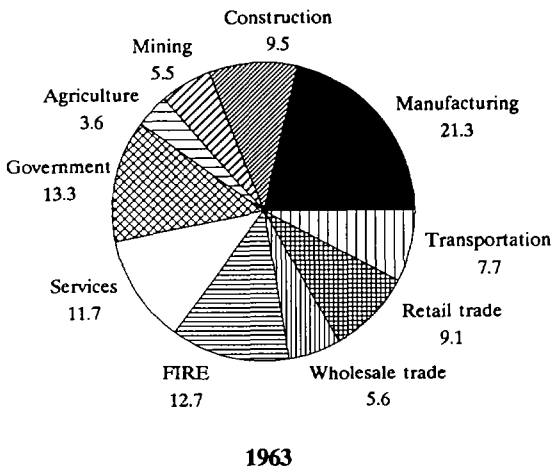
Source: U.S. Department of Commerce, Bureau of Economic Analysis

growth slower than the nation's, the district's share slipped to 7.2 percent.

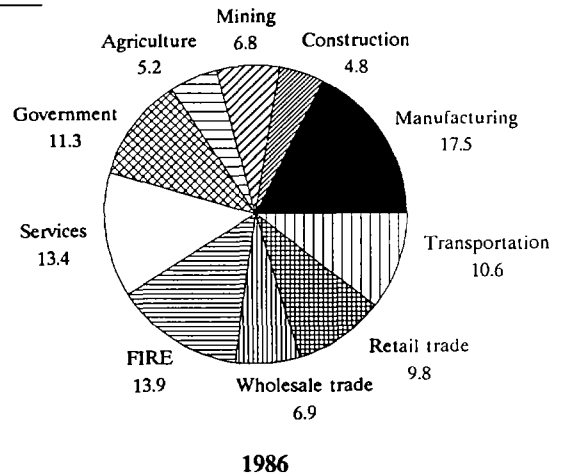
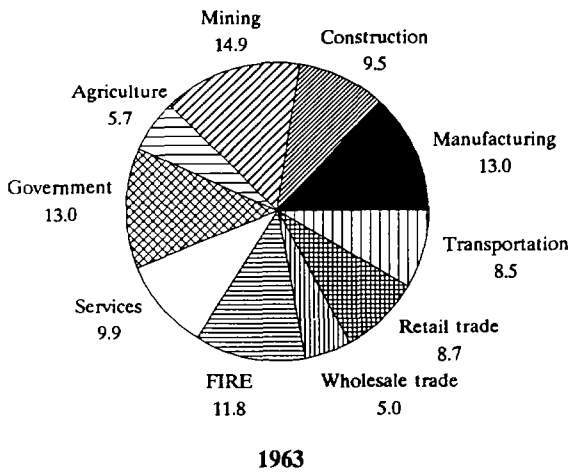
Overall, district shares of U.S. output by industry changed only moderately from 1963 to 1986. For three industries, however, the district contribution changed more significantly. District shares for agriculture, mining, and manufacturing changed by a full percentage point or more. The district's share of total U.S. agriculture and manufacturing output was significantly larger in 1986 than in 1963, while the district's share of national mining output was substantially smaller (Table 1).

**CHART 1**  
**Real GSP by industry as share of total GSP**  
**(percent)**

**United States**

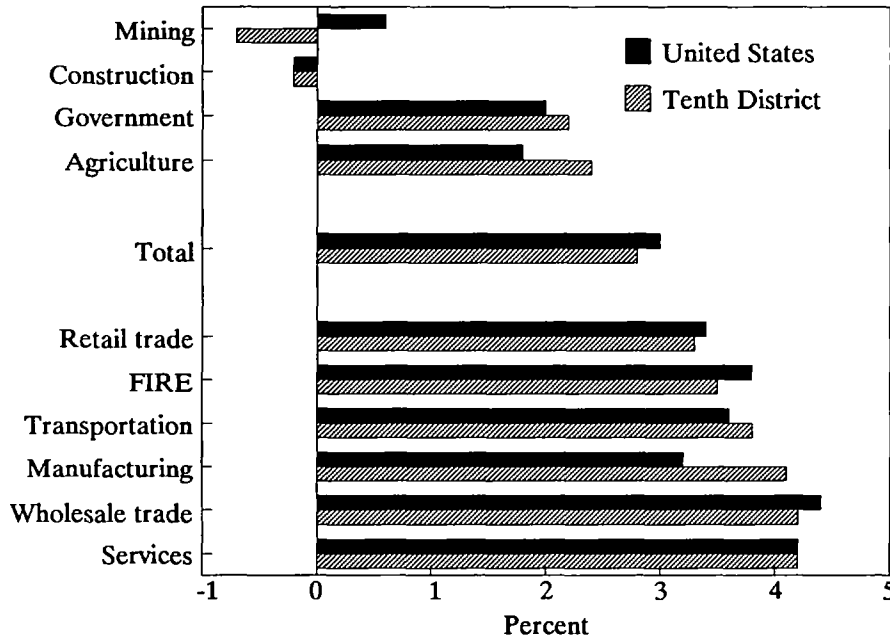


**Tenth District**



Source: U.S. Department of Commerce, Bureau of Economic Analysis

**CHART 2**  
**Real GSP growth by industry in the U.S. and Tenth District, 1963-86**  
 (average annual percent change)



Source: U.S. Department of Commerce, Bureau of Economic Analysis

### Resource-based industries and manufacturing

Two important elements of change in the district economy from 1963 to 1986 emerge from the preceding discussion. One is the continued importance of the region's resource-based industries, agriculture and mining, in spite of the reduced strength in mining. The second is the changing importance of manufacturing for both the district's output growth and its industrial composition.

These continuities and changes can be analyzed further using the information on growth

in real GSP by industry (Chart 2). This information offers two kinds of comparisons. First, for either the district or the nation, growth in any industry can be compared with the same region's total growth. Such comparisons can identify industries as fast growing or slow growing. From 1963 to 1986, for example, manufacturing grew faster than total growth in the district and in the nation, making it a fast growing industry in both the district and the nation. Second, for any industry, growth in the district can be compared with growth in the United States. Manufacturing, for example, grew substantially faster in the district than in

the nation from 1963 to 1986.

*Agriculture.* The relative importance of agriculture to the district economy is apparent from the GSP data. In both 1963 and 1986, agriculture contributed more to district total output than to national output. Agriculture was a slow growth industry in both the district and the United States from 1963 to 1986. That is, district agricultural output grew more slowly than total output in the district, and U.S. agriculture grew more slowly than U.S. total output (Chart 2). At the same time, however, district agriculture grew substantially faster than U.S. agriculture. Because of that growth differential, the district's contribution to total U.S. agricultural output was significantly larger in 1986 than in 1963 (Table 1). Agriculture's share of total district output remained about the same in 1986 as in 1963, however (Chart 1). Overall, the district continues to have abundant agricultural resources, many of which have little alternative use.

*Mining.* The declining relative importance of mining in the district is also apparent from the GSP data. Mining, like agriculture, was a slow growth industry in both the district and the United States from 1963 to 1986. Contrary to agriculture's performance, however, district mining grew slower than U.S. mining (Chart 2). Indeed, the real output of the district mining sector declined from 1963 to 1986. In 1986, the district contribution to total U.S. mining output was substantially smaller than it was in 1963 (Table 1). And, mining's relative contribution to total district output in 1986 was only about half as large as in 1963 (Chart 1).

The performance of district coal mining contrasted with the performance of district oil and gas extraction. Coal mining was the strongest growing segment of the district min-

ing sector. Coal mining growth averaged 10 percent per year from 1963 to 1986, with its highest growth years in the late 1970s and early 1980s. Coal's share of district mining GSP rose from 1 percent in 1963 to 12 percent in 1986. District oil and gas extraction declined about 1 percent per year on average over the period. As a result, the oil and gas extraction share of district mining GSP fell to 81 percent in 1986 from 94 percent in 1963.

A possible interpretation of the district mining sector's comparative weakness might involve the relative importance of the oil and gas sector. Oil and gas extraction was a larger share of mining output in the Tenth District than in the United States during this period. The district oil and gas industry was relatively mature and did not benefit from output-increasing features of the national industry, such as off-shore drilling and the opening of the Alaskan fields.

*Manufacturing.* The strong growth and increasing importance of the district's manufacturing sector are clearly evident from the GSP data. From 1963 to 1986, district manufacturing growth averaged 4.1 percent per year—faster than the national growth of 3.2 percent (Chart 2). Consequently, district manufacturing made up about 5.7 percent of U.S. manufacturing output in 1986, up from about 4.6 percent in 1963 (Table 1).

Manufacturing also became a larger share of total district output. In 1963, manufacturing contributed 13 percent of district total output—less than mining's share and equal to the government's share (Chart 1). But, by 1986 the manufacturing share of district total output—17.5 percent—was larger than the output share of any other major industrial division.

Durable goods manufacturing in the district



## Industry growth trends and industrial structure in district states

### Total output growth

Total output growth among district states varied greatly from 1963 to 1986, as measured by GSP. Colorado's growth of 4.2 percent per year outpaced the nation's 3 percent growth. Growth in the six other district states ranged from 2.3 percent to 2.6 percent per year, far less than Colorado's growth rate and well below the national average (Table 2).

No district state—not even Colorado—grew faster than the nation in either the mid-1960s or the mid-1980s. Missouri's real output growth kept pace with the nation's from 1982 to 1986, however, and nearly did so from 1963 to 1967—probably because Missouri's economy resembles that of the nation. From 1982 to 1986, while the nation as a whole was recovering rapidly from recession, total district growth was held back by output declines in Oklahoma and Wyoming and slow growth in New Mexico.

In the 1970s, the output growth rates of individual states varied. Colorado grew substantially faster than the United States in each period. Missouri grew more slowly than the United States in all three periods, especially from 1977 to 1982, when Missouri suffered far more from the brief 1980 recession than did the nation. Relatively slow GSP growth in Kansas and Nebraska from 1977 to 1982 was still enough to outpace the even slower U.S. growth in that period. Strong growth years in the late 1960s, and again in the late 1970s and early 1980s, gave Oklahoma faster output growth

than the United States from 1967 to 1972 and again from 1977 to 1982. New Mexico and Wyoming growth far surpassed U.S. growth from 1972 to 1982, as those two states posted their highest growth rates in the 1963-86 period.

### Industry growth and structure in district states

Comparing state and U.S. industry growth rates from 1963 to 1986 reveals a great deal of diversity (Table A-1). The comparison between Colorado and the nation is the simplest, because output growth in every major sector of the Colorado economy was greater from 1963 to 1986 than growth in corresponding sectors of the national economy. The only other district state coming close to such a relationship was Oklahoma, which posted growth equal to or greater than the national pace in every industrial sector except mining.

Manufacturing was the industry in which the most district states had output growth faster than the nation's. All district states except Wyoming recorded faster growth in factory output from 1963 to 1986 than occurred in the United States as a whole.

Changes in industrial structure from 1963 to 1986 were quite consistent across district states (Tables A-2 and A-3). Manufacturing contributed a larger share of total output in 1986 than in 1963 in every state but Wyoming. Mining made up a smaller share of total output in 1986 than in 1963 in all district states except Missouri. Mining still provided a substantial

**TABLE A-1**  
**Real GSP growth by industry, 1963-86**  
(Average annual percent changes)

<u>Industry</u>	<u>US</u>	<u>Tenth District</u>	<u>CO</u>	<u>KS</u>	<u>MO</u>	<u>NE</u>	<u>NM</u>	<u>OK</u>	<u>WY</u>
Agriculture	1.8	2.4	3.1	2.6	0.8	3.4	1.3	3.0	-1.1
Mining	0.6	-0.7	1.2	-5.0	2.6	-7.9	0.1	-0.7	0.7
Construction	-0.2	-0.2	1.2	-1.1	-1.6	-2.5	-1.5	-0.2	3.4
Manufacturing	3.2	4.1	5.4	3.9	3.3	4.6	6.6	5.1	0.0
Transportation	3.6	3.8	5.6	3.4	2.9	3.4	4.4	3.9	5.0
Wholesale trade	4.4	4.2	5.5	5.0	3.0	4.1	4.9	4.5	6.1
Retail trade	3.4	3.3	4.9	2.4	2.9	2.1	3.8	3.8	3.3
FIRE	3.8	3.5	4.5	2.9	2.9	2.8	4.9	3.8	4.9
Services	4.2	4.2	5.5	3.9	3.7	3.5	3.9	4.3	3.4
Government	2.0	2.2	2.8	2.1	1.8	1.6	2.0	2.2	2.9
Total	3.0	2.8	4.2	2.3	2.6	2.6	2.6	2.6	2.3

Source: See Table 1.

**TABLE A-2**  
**Industry output as a share of total GSP, 1963**  
(Percent)

<u>Industry</u>	<u>US</u>	<u>Tenth District</u>	<u>CO</u>	<u>KS</u>	<u>MO</u>	<u>NE</u>	<u>NM</u>	<u>OK</u>	<u>WY</u>
Agriculture	3.6	5.7	4.1	8.0	4.9	12.9	3.6	4.0	4.8
Mining	5.5	14.9	7.8	16.3	0.4	4.0	33.4	30.8	48.3
Construction	9.5	9.5	11.2	8.4	10.6	11.0	8.1	7.3	8.3
Manufacturing	21.3	13.0	11.5	13.9	21.0	9.8	3.2	9.0	4.7
Transportation	7.7	8.5	7.9	9.0	10.0	9.2	6.5	7.0	6.6
Wholesale trade	5.6	5.0	5.2	4.1	7.0	5.4	2.9	4.2	1.6
Retail trade	9.1	8.7	9.1	8.8	10.0	9.9	7.1	7.3	5.0
FIRE	12.7	11.8	13.9	12.3	13.2	14.8	7.9	9.1	6.8
Services	11.7	9.9	11.9	8.4	11.7	10.1	10.2	7.8	5.2
Government	13.3	13.0	17.5	10.8	11.1	13.0	17.2	13.6	8.8

Source: See Table 1.

**TABLE A-3**  
**Industry output as a share of total GSP, 1986**  
**(Percent)**

<u>Industry</u>	<u>US</u>	<u>Tenth District</u>	<u>CO</u>	<u>KS</u>	<u>MO</u>	<u>NE</u>	<u>NM</u>	<u>OK</u>	<u>WY</u>
Agriculture	2.7	5.2	3.2	8.6	3.3	15.5	2.6	4.4	2.2
Mining	3.2	6.8	4.0	3.0	0.4	0.3	18.9	14.6	33.4
Construction	4.6	4.8	5.8	3.9	4.1	3.4	6.3	4.0	10.8
Manufacturing	22.1	17.5	15.0	20.0	24.7	15.4	7.6	15.9	2.8
Transportation	8.9	10.6	10.7	11.5	10.7	10.9	9.6	9.5	12.2
Wholesale trade	7.7	6.9	7.0	7.5	7.8	7.6	4.3	6.4	3.6
Retail trade	9.8	9.8	10.8	9.0	10.6	8.9	9.3	9.5	6.3
FIRE	15.0	13.9	14.9	14.1	14.2	15.4	13.0	12.0	12.1
Services	15.4	13.4	15.8	12.1	15.0	12.3	13.3	11.5	6.7
Government	10.7	11.3	12.8	10.4	9.3	10.5	15.0	12.4	10.1

Source: See Table 1.

share of state output in New Mexico, Oklahoma, and Wyoming, however. Mining's decline in importance was most significant in Colorado and Kansas.

Changes in the relative contribution of agriculture to state total output were mixed. In the district's two most agricultural states—

Kansas and Nebraska—agriculture provided a larger share of total output in 1986 than in 1963; the same was true for Oklahoma. In the other four district states, agriculture was a less important source of total output in 1986 than in 1963. In those four states, agriculture's contribution was closer to the national average.

grew more rapidly from 1963 to 1986 than non-durable goods manufacturing. Consequently, durables output increased from 56 percent of district manufacturing GSP in 1963 to 63 percent in 1986, despite the decline of motor vehicle output from its peak. Output of instruments and electrical equipment grew rapidly from 1963 to 1986, albeit from small bases. The manufacture of transportation equipment other

than motor vehicles turned around in the 1970s and increased strongly toward the end of the period, after dipping slightly in the early 1980s.

### **The total growth outcome**

Total output—a composite of the output of individual industries—grew slower on average in the Tenth District than in the nation from

**TABLE 2**  
**Real GSP growth, 1963-86**  
(Average annual percent changes)

	<u>1963-67</u>	<u>1967-72</u>	<u>1972-77</u>	<u>1977-82</u>	<u>1982-86</u>	<u>1963-86</u>
United States	4.60	2.85	2.56	1.28	4.35	3.00
Tenth District	3.44	3.10	2.83	2.52	2.10	2.80
Colorado	2.80	5.54	4.79	3.87	3.43	4.16
Kansas	3.06	2.36	1.84	1.41	3.22	2.31
Missouri	4.32	2.57	2.20	0.26	4.36	2.59
Nebraska	3.64	2.75	2.34	1.66	2.74	2.57
New Mexico	1.22	2.61	4.06	3.41	1.38	2.64
Oklahoma	4.11	3.17	2.20	4.42	-1.45	2.57
Wyoming	1.86	2.31	4.61	5.95	-4.48	2.28

Source: U.S. Department of Commerce, Bureau of Economic Analysis

1963 to 1986, but district output grew faster in some subperiods. Real output in the district grew 2.8 percent annually from 1963 to 1986, just slightly slower than total U.S. growth of 3.0 percent (Chart 3). While output grew faster on average in the nation from 1963 to 1986, output grew faster in the district in the 1970s—especially if the 1970s period is stretched to include the years from 1967 to 1982 (Table 2).<sup>4</sup>

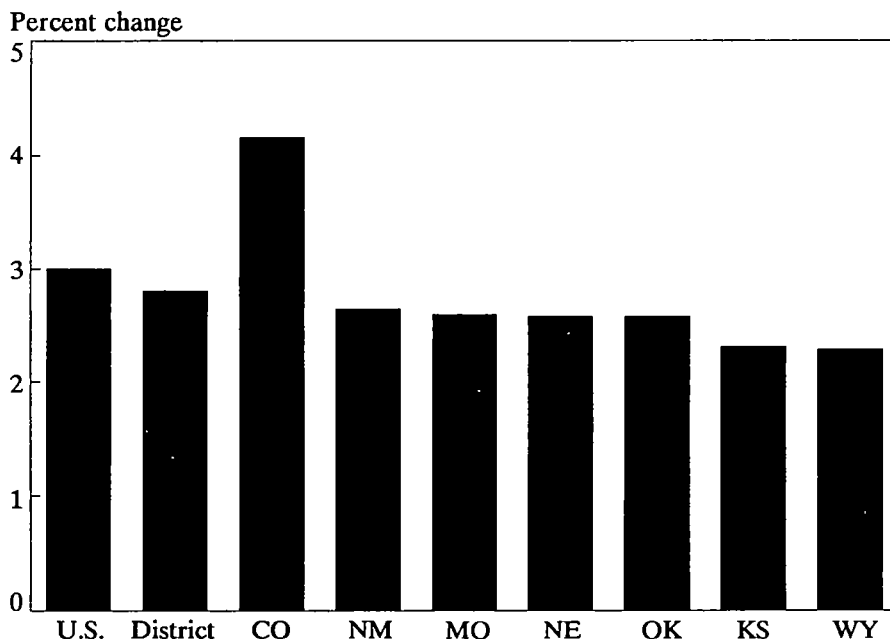
During the three subperiods from 1967 to 1982—the “stretched 1970s”—district growth outpaced U.S. growth, as nearly all major

industries grew faster in the district. District manufacturing growth outpaced growth in the nation primarily because nondurables output growth in the district held up well in the early 1980s. Exceptions to faster growth in the district were mining, which grew slower in the district than in the nation for most of the period, and agriculture, which suffered a period of weakness in the mid-1970s.

Real output grew faster in the nation than in the district both in the mid-1960s and in 1982-86, the first four years of the present business cycle expansion. From 1963 to 1967, U.S. growth surpassed district growth in every major industry but three—agriculture, manufacturing, and government. From 1982 to 1986, the only industry to grow faster in the district than in the nation was agriculture. District manufacturing nearly kept pace with national manufacturing growth from 1982 to 1986, but output from the district’s mining sector fell sharply due to steep declines in both oil and gas extraction and metal mining.

<sup>4</sup> Beginning and ending years for the subperiods are the benchmark years for the GSP estimates, except 1986, which is the most recent year for which an estimate is available. Benchmark years were chosen to identify subperiods on the presumption that benchmark year estimates are better than those for intervening years. The choice of benchmark years to identify subperiods generally provides economically meaningful periods. For example, 1982-86 includes those years of the present business cycle expansion for which GSP estimates are available. All of the benchmark years but one were national business cycle expansion years; 1982 was a recession year.

**CHART 3**  
**Real GSP growth in the U.S. and Tenth District, 1963-86**  
 (average annual percent change)



Source: U.S. Department of Commerce, Bureau of Economic Analysis

Long-run forces have thus shaped a slow growing district economy that in the mid-1980s still differed from the U.S. economy primarily because of the importance of the district's resource-based industries, agriculture and mining. While agriculture has maintained its importance in the district, mining has declined somewhat. Manufacturing, on the other hand, has flourished. These long-run patterns of industrial change are themselves significant forces for future change. Forward-looking analyses and prescriptions for the district economy must acknowledge these trends and the plausibility of their continuation.

### III. SUMMARY

The recently published GSP data permit the study of long-run regional economic performance based on comprehensive output estimates. Such a study of the Tenth District shows that, after nearly 25 years of growth and change, the district economy has become somewhat more like that of the United States as a whole. The district also retains much of its industrial distinctiveness, however. Agriculture and mining (in spite of its decline) remain relatively more important to the district than to the nation. But manufacturing, while

still less important to the district than to the United States, has become an increasingly larger share of district output. These changes have occurred in the context of slower total output growth in the district than in the nation as

a whole. The fundamental trends discussed in this article have helped shape the district economy and are likely to shape its performance in the future.

## Appendix

### Gross state product: definition and construction

The BEA defines gross state product as follows:

GSP is the gross market value of the goods and services attributable to labor and property located in a state. It is the state counterpart of the nation's gross domestic product (GDP) (Renshaw and others 1988, p. 30).

Both GSP and GDP refer to where output is produced and not to where ownership of the factors of production resides. GSP is the total output produced in a state and is that state's contribution to U.S. GDP.

Understanding the construction of GSP can be aided by a brief review of how GNP, the most widely used measure of national output, is measured. While GSP is more closely parallel to GDP than to GNP, the construction of the GSP estimates is discussed in comparison with GNP because data and information on GNP are more readily available. GNP is measured at market value and includes only output in the form of final sales plus business inventory change, in order to avoid double-counting of goods and services embedded in final products. In its most familiar form of presentation, GNP is shown as the sum of purchases by major spending sectors of the economy. These are called the product components of GNP and together represent the product approach to measuring total output (right side of Table A-4).

Like private bookkeeping, national income and product accounting is a double-entry

system. Total national output, or GNP, equals the total income flows generated in producing that output. As a result, GNP can be measured from the income side as well as from the product side of the accounting system. GNP as measured on the product side and on the income side is conceptually the same thing. When actually estimated for a particular period, they differ by a relatively small amount called the statistical discrepancy, because they are measured independently.

The income side measure is made up of what are called "charges against GNP," which are the costs incurred and profits earned in the production of GNP (left side of Table A-4). Total charges against GNP on the income side are separated into factor charges and other charges. Factor charges represent the returns to productive factors for their services—labor compensation, proprietors' income, rental income of persons, corporate profits, and net interest. The other charges are composed primarily of indirect business tax liabilities and capital consumption allowances. Indirect business tax liabilities include sales, excise, and property taxes. These tax liabilities are not earned income but are included in the market value of output and thus are included in charges against GNP on the income side of the national accounts. Capital consumption allowances are mainly depreciation charges representing the using up of fixed capital in the production of output. Because depreciation costs are embedded in the market value of output, they

**TABLE A-4  
National income and product account, 1987**

<u>Income-side components</u>	<u>\$ Billions</u>	<u>Product-side components</u>	<u>\$ Billions</u>
Compensation of employees	2,683.4	Personal consumption expenditures	3,012.1
Proprietors' income	312.9	Gross private domestic investment	712.9
Rental income	18.4	Net exports	-123.0
Corporate profits	310.4		
Net interest	353.6	Government purchases	924.7
Indirect business taxes	376.1		
Capital consumption allowances	480.0		
Statistical discrepancy	-8.1		
GNP	4,526.7	GNP	4,526.7

Source: See Table 1.

also appear on the income side of the national accounts as a charge against GNP.

Just as GNP can be measured from the income side, the BEA measures GSP from the income side to estimate the gross market value of a state's output. Four components, or charges to GSP, are estimated: compensation of employees, proprietors' income, indirect business tax liability, and other, mainly capital-related, charges. The last component includes rental income, net interest, corporate profits, and capital consumption allowances. The four

components are summed to give the GSP estimate of the goods and services produced by labor and property located in a state.

GSP is estimated both in nominal (current dollar) terms and in real (constant dollar) terms. While the nominal series may be used for analyzing such things as the differential regional effects of relative price changes, estimates of real GSP provide the data for analysis of changes in the physical volume of output. Real GSP estimates in constant 1982 dollars are based on national price deflators by industry.



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