

UeBOR

**Utah Economic and
Business Review**

**Volume 51
Number 3
March 1991**

BEER

**graduate school
of business
bureau of economic and
business research
university of utah**

MANUFACTURING IN THE WEST SINCE WORLD WAR II¹

James A. Wood, Research Analyst

Prior to World War II, the West's manufacturing beginnings were found in the economic booms that settled and exploited the region: mining booms, cattle booms, farming booms and lumber booms. Although the West was isolated from major markets and nearly empty of people, its valuable natural resources brought manufacturing activity to the region as transportation costs forced manufacturers to locate near their resource. Thus, the early character of manufacturing in the western states came to be determined by the distribution of natural resources and transportation costs; but by 1990, the character of manufacturing had changed. Although mining and agriculture continued to exert an influence, World War II had become the most powerful defining force of manufacturing in the West.

Following World War II the United States entered a period of economic prosperity. Each western state shared in the national economic growth, but unevenly. In no other sector was the imbalance in economic development more conspicuous than in manufacturing. The objective of this paper is to present a comparative treatment of the postwar performance of manufacturing in the western states to better understand the process of western economic development.

The Changing Presence of Manufacturing in the West

Following World War II, the West's manufacturing sector lagged far behind the national average. In 1946, manufacturing earnings in the West represented only 8.3 percent of total earnings compared to 26.6 percent nationally. Colorado was the only western state

¹ The geographic boundaries used herein are designated by the U.S. Bureau of the Census for the Mountain States: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming. The structure, character and economic growth of this so-called region, however, demonstrate significant differences, particularly regarding Montana and Wyoming. The economies of Montana and Wyoming, in many respects, are more similar to North Dakota, South Dakota and Nebraska than the western states; therefore, they are at times given a minor status in the state-by-state comparisons.

where manufacturing earnings as a percent of total earnings exceeded 10 percent. By western states' standards, Utah's manufacturing sector had a respectable 9.3 percent of total earnings (Table 1).

Table 1

Manufacturing Earnings as Percent of Total Earnings

State	1946	1950	1960	1970	1980	1989
Arizona	5.97%	7.00%	13.57%	16.15%	17.15%	15.52%
Colorado	11.34	13.71	16.26	15.63	15.61	15.04
Idaho	8.70	12.25	15.94	15.78	17.30	17.54
Montana	7.32	8.27	10.99	10.46	9.94	8.39
Nevada	4.61	5.54	5.03	4.01	4.98	4.42
New Mexico	5.92	5.91	6.43	5.86	6.74	7.84
Utah	9.27	13.26	18.66	15.59	17.12	16.88
Wyoming	5.65	6.13	7.84	6.11	4.56	4.97
U.S.	26.64	28.76	29.44	26.64	24.61	19.68

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

World War II served as the catalyst for the expansion of manufacturing in the West. Wartime expenditures by the federal government produced an enormous capital investment in science, technology, and manufacturing facilities; investments which would quicken the postwar economic diversification of the region. Perhaps the most dramatic and symbolic war-related expansion was the extension of the steel industry to the West with the federal government's decision to build the Geneva Steel Works near Provo, Utah. The steel industry epitomized the dominance of eastern manufacturing and any expansion to the West was vigorously opposed by eastern industrialists. Despite the opposition of these industrialists, the war was transforming the nation's economy and closing the manufacturing gap between the East and the West.

No other event in this century approaches the impact that World War II had on Utah's manufacturing sector. The federal government's \$200 million investment in the Geneva Steel Works would significantly alter the composition of Utah's manufacturing sector. Without federal funds, Utah's steel industry probably would have remained a modest component of the state's manufacturing sector. Private capital markets simply would not have risked a \$200 million investment in a steel plant in Provo, Utah. The sparsely populated western states were too isolated and distant from major west coast markets to justify huge capital investments in large-scale

manufacturing operations. At the time an investment of more than \$20 million in any one year in new plant and equipment in Utah was considered extraordinary. In 1947, new plant and equipment expenditures in the state were only \$17 million, and not until 1974 did investment in new plant and equipment exceed \$100 million.²

The federal government had stepped up as wartime financier to reshape Utah's manufacturing sector. Prior to World War II, manufacturing in Utah had been largely characterized by the processing of farm products and nonferrous metals. In 1940, 44 percent of all manufacturing employees in Utah were involved in activities such as refining sugar from sugar beets, canning fruits and vegetables, milling grain and producing dairy products, i.e., the Food and Kindred Products sector. But with the opening of the Geneva Steel Works, Utah's manufacturing sector began the shift from principally residential activity to export-based activity. "Blast Furnace and Steel Mill" employment would now join the "Smelting and Refining of Nonferrous Metals" by Kennecott Copper employees as important export-based manufacturing activities.

During the immediate postwar period and the decade of the 1950's, manufacturing activity made huge gains in the West. Leading the rise was Arizona, where manufacturing earnings increased an astonishing 850 percent between 1946 and 1960. Utah ranked second among the eight western states with a gain of 510 percent for the period. A more detailed look at Utah shows that the manufacturing sector was the stellar performer among all employment sectors in the immediate postwar period.

Increase in Earnings in Utah 1946-1960

Manufacturing	510%
Mining	306%
Construction	350%
Transportation and Public Utilities	203%
Trade	218%
Finance, Insurance, Real Estate	418%
Services	380%
Government	228%

Source: Bureau of Economic Analysis, State Personal Income, 1929-1987, July 1989.

² U.S. Department of Commerce, Bureau of the Census, Census of Manufactures, Utah.

Although gains in manufacturing earnings came to all western states, the relative importance of manufacturing in Montana, Nevada, New Mexico and Wyoming remained, for all practical purposes, unchanged. Nevada is a particularly interesting case. The average annual real growth rate in Nevada's manufacturing earnings is higher than every other western state except Arizona (Table 2). Despite this rapid growth, the relative position of manufacturing remains unchanged because other non-manufacturing sectors in Nevada have grown so rapidly (data appear in Table 1).

Table 2
Manufacturing Earnings by State
(Constant Dollars - 1989)

State	Manuf. Earnings 1946 (millions)	Manuf. Earnings 1989 (millions)	Average Annual Growth Rate
Arizona	\$213.5	\$6,087	8.1
Colorado	829.6	6,526	4.9
Utah	335.5	2,854	5.1
Idaho	286.7	1,782	4.3
New Mexico	158.6	1,108	4.6
Nevada	61.0	700	5.8
Montana	256.2	619	2.1
Wyoming	103.7	242	2.0
U.S.	\$240,645	\$625,476	2.2

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

In those states where the growth in manufacturing earnings have exceeded that of the non-manufacturing sectors, the relative importance of manufacturing has increased. The most meaningful achievements have been in the three states--Arizona, Idaho and Utah--where the percent share of manufacturing earnings in each state nearly doubled during the 1946-to-1960 period. For these three states the real growth rates in manufacturing earnings since World War II have been 8.1 percent, 4.3 percent and 5.1 percent respectively.

Colorado with \$6.5 billion in manufacturing earnings in 1989 has never relinquished its number one ranking as the top manufacturing state in the West notwithstanding the rapid growth of Arizona. The

expansion of Arizona's manufacturing sector has led to large gains in the state's share of manufacturing in the West. Immediately following the war, Arizona's manufacturing sector accounted for only 9.5 percent of total manufacturing earnings in the western states, and was ranked behind Colorado, Utah, Idaho and Montana. Today, with nearly 31 percent of the total manufacturing earnings in the region, Arizona's position is second only to Colorado. These two states dominate total manufacturing earnings in the region. Over the postwar period, Utah has managed to hold on to its relative share of manufacturing in the region; whereas Montana's position has seriously eroded, declining from 11.4 percent to 3.1 percent (Table 3).

Table 3
Percent Distribution of Manufacturing Earnings
Within the Region

State	Percent Distribution of Manufacturing Earnings 1946	1989
Arizona	9.5	30.6
Colorado	37.0	32.8
Idaho	12.8	9.0
Montana	11.4	3.1
New Mexico	7.1	5.6
Nevada	2.7	3.5
Utah	15.0	14.3
Wyoming	4.6	1.2

Source: Bureau of Economic Analysis, State Personal Income: 1929-87 and Survey of Current Business, August 1990.

From a review of the data it seems reasonable to conclude that among the eight states of the region, four of them--Arizona, Colorado, Utah and Idaho--each have a notable presence of manufacturing activity; whereas in the remaining four states of Montana, Nevada, New Mexico and Wyoming, manufacturing plays a secondary or minor economic role. The former set of states now approaches the national average in terms of the relative share of manufacturing earnings. In 1989, in the U.S. economy manufacturing earnings represented 19.7 percent of total earnings; only slightly greater than the western states of Arizona, Colorado, Idaho and Utah, where manufacturing accounted for 15 to 17 percent of total earnings (shown in Table 1).

Manufacturing in the West, although still only a fraction of total manufacturing activity in the United States, has an improved presence. In 1989, manufacturing earnings in the eight western states accounted for 3.2 percent of the U.S. total, a significant increase over the 0.9 percent share for the region in 1946.

Manufacturing Employment and Wages in the West

In a broad sense, the western states move together as a group, with advances and declines in manufacturing employment. Wyoming and Montana, however, remain on the periphery, too remote geographically and too small economically to fully participate. But for the remaining six states they do seem to act in concert, i.e., move the same direction with increases and decreases in manufacturing employment. In 24 of the 44 years since World War II, manufacturing employment in all six states has moved in the same direction. The longest period of complete unanimity was from 1971 to 1979. The widespread prosperity was interrupted by the single worst year for postwar manufacturing in the West--1975. The recession of that year rippled through every western state, reducing manufacturing employment in the region by 29,200 jobs, a 6.5 percent reduction in manufacturing employment.

Manufacturing employment trends for each decade show that the region performed better during the 1950's and the 1970's than in the 1960's and 1980's. Of some note is the extent of the slowdown in manufacturing job growth in the 1980's. It is estimated there will be 100,000 fewer new manufacturing jobs in the West in the 1980's than there were in the 1970's. A sense of the ebb and flow of manufacturing employment within the region is illustrated by the data in Table 4.

The 1980's have been a period of diverse performance among western states. Arizona and Colorado have suffered considerable weakness in their manufacturing sectors over the past five years. The extent of this weakness is confirmed by the fact that Utah, despite major layoffs in Primary Metals at Geneva Steel and Kennecott Copper, led the western states in manufacturing job growth for the 1985-1990 period, as follows:

State Increases in Manufacturing Jobs, 1985-1990

Utah	12,300	Nevada	4,300
Idaho	9,700	Colorado	3,700
Arizona	7,600	Montana	1,500
New Mexico	5,600	Wyoming	1,000

Source: U.S. Department of Labor, Employment and Earnings.

Table 4
Change in Manufacturing Employment by Decade
(in thousands)

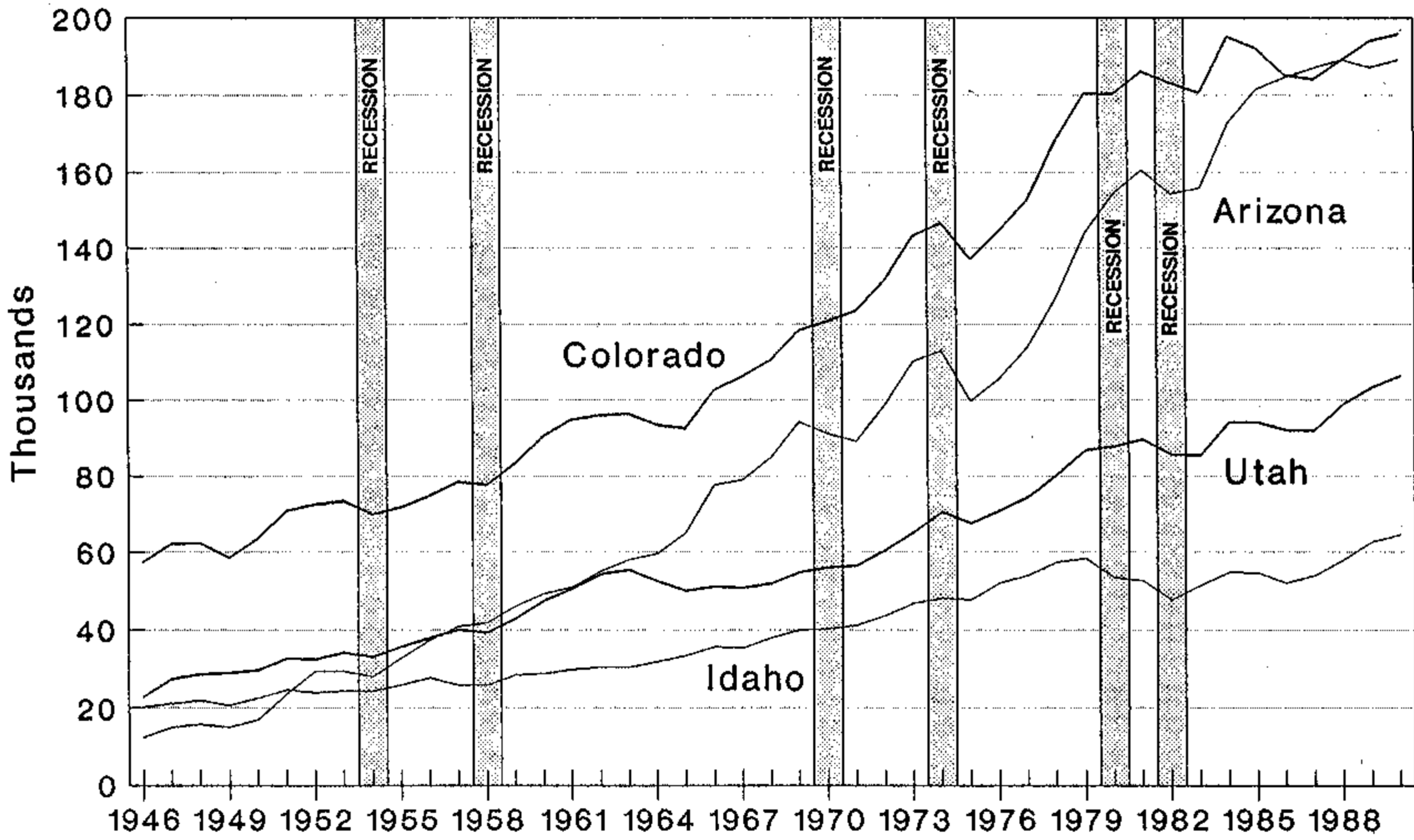
State	1950-1960	1960-1970	1970-1980	1980-1990
Arizona	32.3	41.9	63.2	34.8
Colorado	27.0	30.2	59.6	15.5
Idaho	6.4	11.5	13.2	10.9
Montana	2.4	3.6	.3	-1.0
Nevada	1.9	3.2	10.6	7.0
New Mexico	6.8	4.3	13	8.5
Utah	17.8	8.5	31.7	18.6
Wyoming	2.0	-1.0	2.2	-6
Empoyment Growth	96.6	102.2	193.8	93.7
Percent Change	57%	38.2%	52.4%	16.6%

Source: U.S. Department of Labor, Bureau of Labor Statistics.

The performance of manufacturing employment in times of recession and expansion is shown in Charts 1 and 2. Among the four states included in Chart 1, the performance of Arizona's manufacturing sector has been the most spectacular. Beginning in 1946 with only 12,000 manufacturing jobs, about half of the number of manufacturing jobs in Utah in 1946, Arizona's upward trend line has been interrupted only by recessions; whereas in Colorado and Utah, manufacturing employment has declined substantially on two non-recessionary occasions, the 1963-65 period and the mid-1980's.

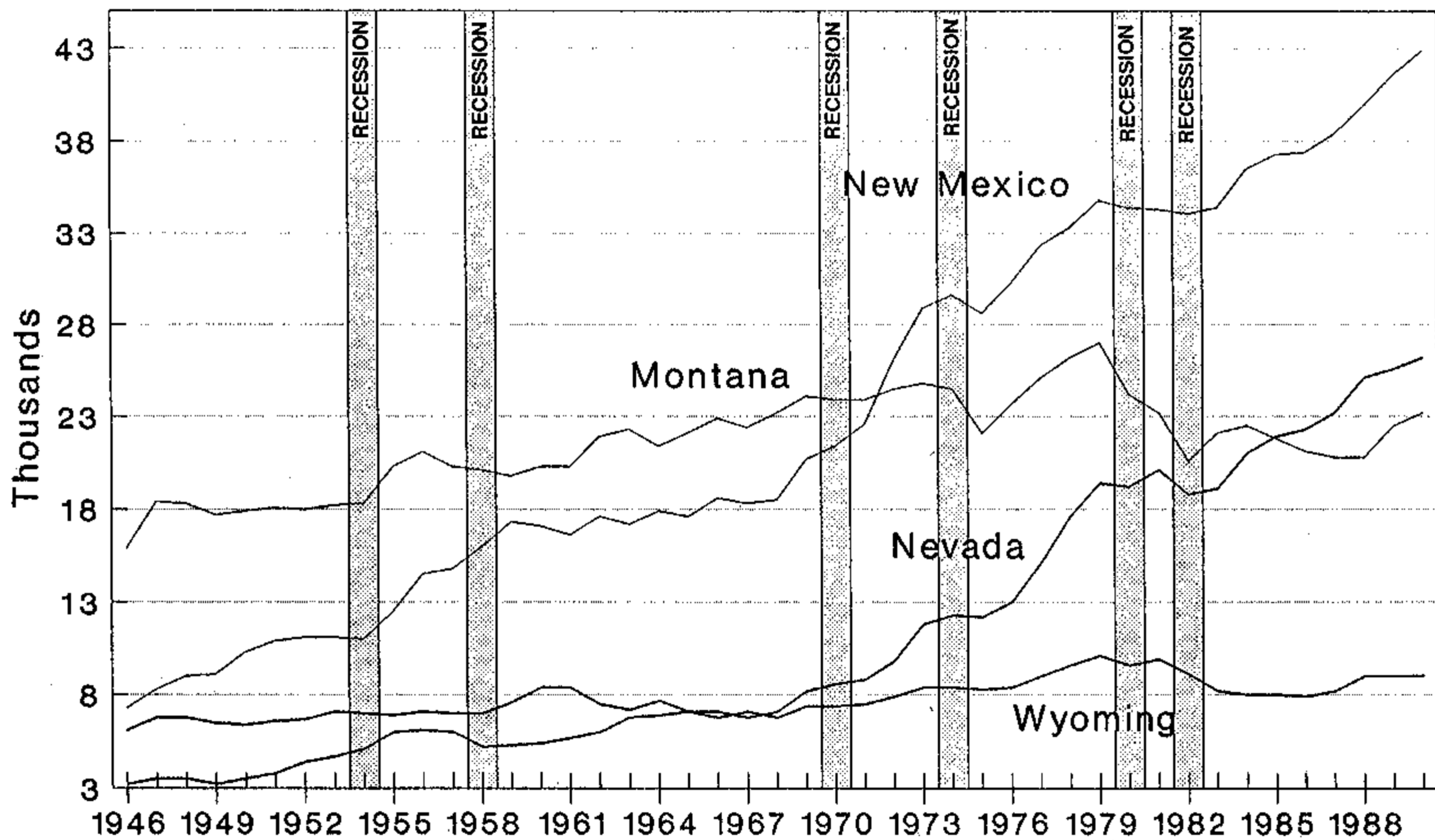
The trend line for manufacturing employment in Utah depicts a loss of jobs in four of the six postwar recessions; the worst recession was in 1982 when manufacturing employment declined by 4.0 percent -- 3,600 jobs. During the 1970 and 1979 recessions, manufacturing employment did not decline in Utah, but employment growth slowed to about 1 percent.

Chart 1
Manufacturing Employment in Four Western States
1946 to 1990



Source: Bureau of Labor Statistics

Chart 2
Manufacturing Employment in Four Western States
1946 to 1990



Source: Bureau of Labor Statistics

The 1963-1965 downturn in manufacturing employment in Utah originated with reductions in aerospace spending by the U.S. Department of Defense. These cutbacks precipitated the largest postwar employment decline in Utah's manufacturing sector. In two years, manufacturing employment dropped by over 10 percent, as Utah's aerospace industry lost 6,000 jobs. At Thiokol Corporation in Box Elder County, employment declined from 6,000 to 3,000 employees, following the decision to discontinue development of the Mobile Mid-Range Ballistic Missile.³ Aerospace employment was also declining at Hercules Powder Company's Bacchus Works in Salt Lake County. At the end of 1962, Hercules had employed 6,000 workers, reflecting a rapid employment build-up for research and development of the Minuteman and Polaris missile systems.⁴ By 1964, these missile systems had become operational, and employment layoffs followed, which reduced the work force at Hercules from 6,000 to 4,000.⁵

The 1986 decline in manufacturing employment in Utah reflects a loss of employment in the Primary Metals subsector due to the closure of Geneva Works of USX Corporation in Provo, Utah, and layoffs at milling and smelting operations of the Utah Copper Division of Kennecott Copper.⁶ The employment volatility of Primary Metals has increased the vulnerability of Utah's manufacturing sector to recessions, but each western state has its own special vulnerability. Idaho lost nearly 20 percent of its manufacturing jobs between 1979 and 1983 in a four-year collapse of the lumber and wood product markets. Arizona's manufacturing sector was badly hurt in 1974 when a downturn in semiconductors led to layoffs of 8,000 employees.

Manufacturing Wages

The dominance of Arizona and Colorado in western manufacturing is illustrated in Chart 3. Together these two states account for nearly 60 percent of the manufacturing employment in the West, and they also

³ "No Further Layoffs Due at Thiokol" Ogden Standard Examiner, September 20, 1964.

⁴ "Hercules' Future Appears Bright" Deseret News, January 15, 1963.

⁵ "No Drastic Job Cuts Seen for Bacchus", Deseret News, September 26, 1964.

⁶ Primary Metals includes basic steel products, milling and smelting nonferrous metals (e.g., copper) and foundry work.

enjoy the highest manufacturing wage rates. Colorado had the highest annual average manufacturing wage rate in 1989--\$29,443, and New Mexico had the lowest annual manufacturing wage rate--\$22,001, Table 5. Utah ranks third. The two highest wage manufacturing subsectors in Utah are Primary Metals and Transportation Equipment.

Although the ranking by wage rate for these five states has not changed over the past 20 years, the wage gains in Colorado and Arizona have outdistanced those in the three remaining states. In 1969, Utah's annual average manufacturing wage rate was 89 percent of Colorado's; but by 1989 it had dropped to 82 percent. Over the same period, Idaho's manufacturing wage rate has slipped from 84 percent to 80 percent of Colorado; New Mexico dropped from 79 percent to 74 percent.

Also disturbing has been the decline in real wages. In real terms, manufacturing wages in Utah have declined 3.9 percent in the past 20 years. Utah is not unique in this respect--other western states have had a similar experience. In part, the decline in real wages can be explained by the changing composition of the manufacturing sector, especially in Utah. The loss of jobs in Utah's high wage Primary Metals industry has certainly contributed to a deteriorating real wage rate.

The Structure of Manufacturing in the West

The essential characteristic of postwar manufacturing in the West has been its diminishing dependence on natural resources based products, e.g., lumber, processed minerals and agricultural goods. Postwar growth has been centered in the production of intermediate and finished manufactured products such as semiconductors, computers, and aircraft parts.

The exceptions are the small manufacturing sectors of Wyoming and Montana that are still dominated by industries that process natural resources. Also, Nevada is a special case. Here manufacturing affects a residentiary nature (produced for local consumption) but without the traditional ties to agriculture. Tourism determines the direction of manufacturing development in Nevada, as evidenced by the leading manufacturing activities: printing and publishing, the stone, clay and glass products and the miscellaneous manufacturing industries. For the other states, some important remnants of the prewar pattern remain: meat packing in Colorado, lumber and processed vegetables (potatoes) in Idaho; and primary metals, fluid milk and cheese products in Utah.

Chart 3
Percent Distribution of Manufacturing Employment, Mountain States
(Thousands of Employees)
1990

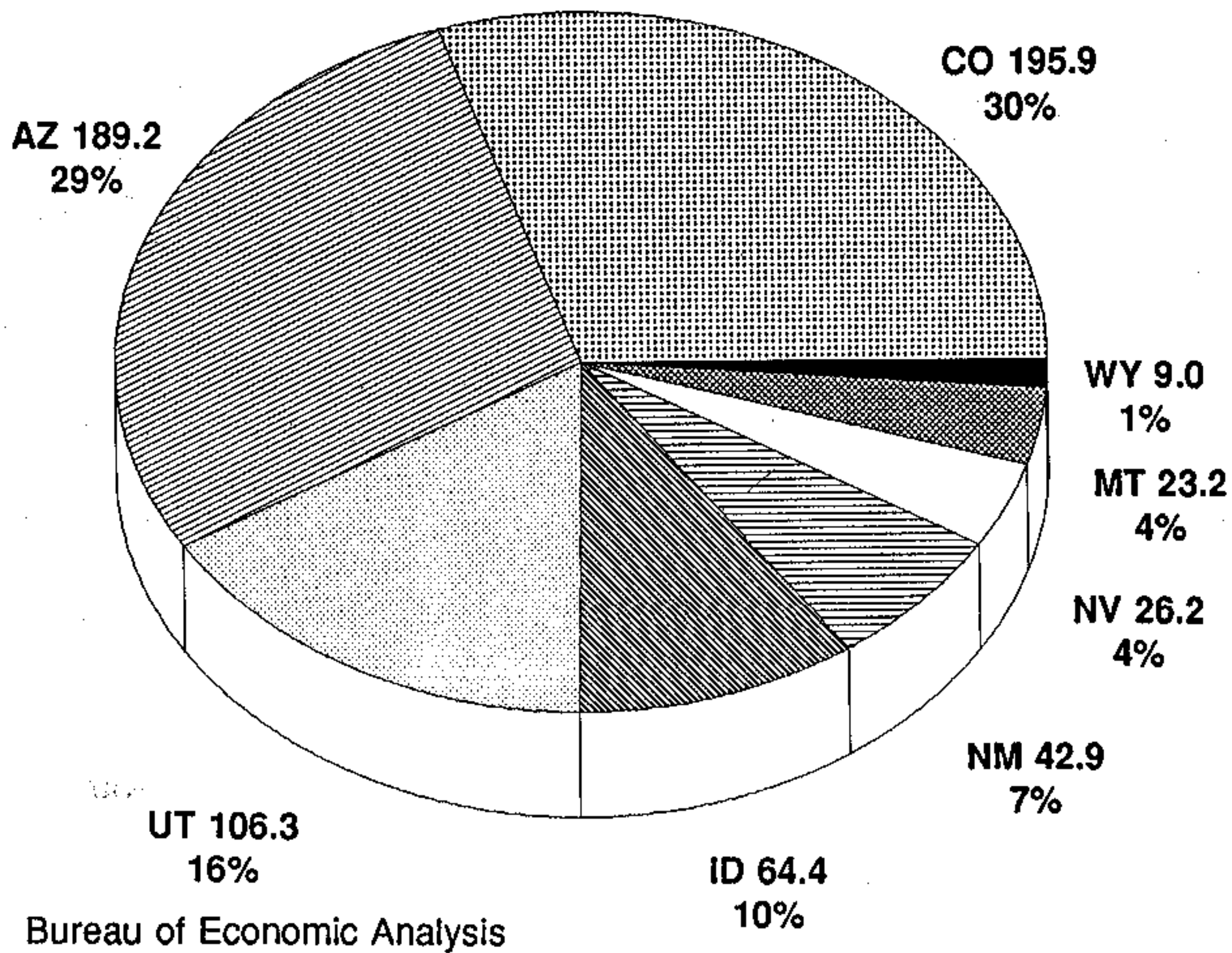


Table 5
Average Annual Wage Rates by
Manufacturing Sector
(1989)

Sector/State	Arizona	Colorado	Idaho	New Mexico	Utah
Manufacturing	\$28,266	\$29,433	\$23,653	\$22,001	\$24,072
Food & Kindred Products	20,675	25,876	20,031	16,672	18,169
Chemicals	24,435	36,572	35,602	21,353	26,717
Lumber	17,991	d	24,858	17,445	17,741
Primary Metals	27,588	26,908	23,601	28,815	33,403
Fabricated Metals	21,062	24,653	19,705	17,801	22,648
Machinery, except elec.	37,499	35,236	29,001	25,927	26,518
Electronic components	31,191	31,669	28,663	26,419	28,269
Transportation Equipment	36,756	d	15,057	32,845	33,276
Instruments	32,861	30,605	17,528	27,465	22,648

d Not shown to avoid disclosure.

Source: U.S. Department of Labor, Employment and Wages Annual Averages 1989, October, 1990.

Otherwise the manufacturing matrix of the West reflects the emergence of high wage, high technology-based industries: computer, electronics and aerospace; industries that in large part, were created by federal research and development expenditures during World War II, and have remained centered in the western United States. A great advantage for remaining in the West was the research infrastructure developed with such universities as Stanford, Berkeley, and the California Institute of Technology. Also many of the new companies, with their affluent, white-collar employees, preferred the non-union environment of western locations.

These new technology-based industries enjoyed much greater locational freedom because transportation costs were less significant in the production of their lightweight, high value products; hence they became known as "footloose" industries. These footloose industries "develop purely by chance in some locations."⁷ In 1950 when Motorola chose Phoenix as the location for a semiconductor plant, that city had no commanding comparative advantage over Denver, Salt Lake or Albuquerque. The same is true of Hewlett Packard's decision in 1963 to locate in Colorado or Sperry Rand's (now Unisys) decision in 1956 to locate in Utah. But the choice of the state and the region by these types of companies has come to dominate the structure of manufacturing in most

western states, as well as influence the development of the residentiary industries such as "specialized banking, brokerage, wholesaling and other business services..."⁸

Computer, Electronics and Aerospace Industries in the West

Although the five western states of Arizona, Colorado, Idaho, New Mexico and Utah have only 3.0 percent of the total U.S. manufacturing employment, they have a much greater share of manufacturing employment in the computer, electronics and aerospace industries. The percent share of employees in 1989 in each industry for the five western states is given below:

- Computer and Office Equipment (SIC 357) 8.2%
- Electronic Components (SIC 367) 9.7%
- Aircraft and Aircraft Parts (SIC 372) 3.5%^a
- Guided Missiles (SIC 376) 16.9%

^a Arizona has 75 percent of the aircraft employment in the five-state area.

There are 114 manufacturing industries at the three-digit SIC level and the four industries listed above comprise some of the largest and fastest growing. The computer industry (SIC 357) and the electronics industry (SIC 367) rank third and fourth in total employment growth since 1969. The guided missile

⁷ North, Douglass C., "Location Theory and Regional Economic Growth," *Regional Economics*, edited by David L. McKee, Robert D. Dean and William Leahy, Free Press, 1970, pg. 42.

⁸ North, pages 39-40.

Table 6
Manufacturing Employment in Selected Sectors
(1989)

Sector	Arizona	Colorado	Idaho	New Mexico	Utah	United States
Computers	8,368	21,182	4,124	835	2,756	454,963
Electronics	34,445	7,922	4,619	3,942	8,686	614,036
Aircraft Parts	18,951	2,127	89	1,929	1,872	708,686
Guided Missiles	6,500	13,247	0	1,056	12,133	195,009
Total	68,264	44,478	8,832	7,762	25,447	1,972,694
Percent of State's Total Manufacturing	36.3%	23.1%	14.5%	18.5%	24.9%	10.2%

Source: Department of Employment Security Offices for each state.

industry ranks 11th with an increase of more than 66,000 employees in the last 20 years.

Unlike the early manufacturing history of the United States, when the West was largely excluded from events, the postwar period has been a time of manufacturing expansion for the West, and the region has come to specialize in some of the fastest growing manufacturing sectors. Employment data by state for the computer, electronics and aerospace industries are given in Table 6.

The Decline of Food and Kindred Products and Primary Metals

The postwar paradigm for most western states has been the structural shift to manufacturing activities producing technology-based export commodities. The gains in Electronics, Computers and Aerospace have come at the expense, so to speak, of the Food and Kindred Products and Primary Metals subsectors.

Food and Kindred Products ranked either first or second in terms of manufacturing earnings in every western state in 1960. But by 1989 the relative importance of this subsector had declined in each state; most precipitously in Arizona where the Food and Kindred Products share declined from 13 percent of earnings in 1960 to only 3.9 percent in 1989. In Utah, Food and Kindred Products declined from 16.7 percent of manufactured earnings in 1960 to 8.4 percent in 1989. The shrinking share of earnings for Food and Kindred Products in Utah was halted in the mid-80's when All American Gourmet and Stouffer Foods Corporation established frozen food operations in the state.

The Primary Metals subsector (blast furnaces, steel products, foundries, and nonferrous rolling and drawing) in Arizona, Colorado and Utah has also undergone significant declines in its relative position. Since 1960, the share of manufacturing earnings generated by the Primary Metals subsector in Arizona has dropped from 8.3 percent to 4.3 percent. The most dramatic declines, however, have occurred in Colorado and Utah. In 1960, Primary Metals accounted for 11.4 percent of manufacturing earnings in Colorado and a hefty 24.2 percent in Utah, where it was the largest manufacturing subsector. By 1989, Primary Metals earnings had dropped to only 1.6 percent in Colorado and 7.7 percent in Utah. Currently, the Colorado Fuel and Iron Company of Pueblo is fighting for survival; but in its heyday of

producing steel rails, the company had employed as many as 15,000 workers and had been part of the Rockefeller empire. In Utah, Geneva Steel was sold in 1987 by USX Corporation for \$44.1 million to Basic Manufacturing and Technologies of Utah. Geneva Steel had been closed for over a year, due initially to a labor dispute; however, once the dispute was settled, USX decided against reopening the facility. Today Geneva Steel employs about 2,700 workers, approximately one-third the number employed in 1960.

The shift in the structure of Utah's manufacturing sector from primary metals and food processing to aerospace and electronics is shown in Table 7. In Table 8, the major manufacturing subsectors are ranked for each state. There data show the concentration of manufacturing activity for several states in electronics, machinery (computers) and transportation (aerospace).

Table 7

The Structure of Manufacturing in Utah

Sector	Percent of Manufacturing Earnings			
	1989	1980	1970	1960
Durable Goods	74.3	75.0	69.0	68.0
Trans. Equipment	21.3	12.4	12.4	14.6
Electronic Components	13.2	7.6	5.1	1.8
Machinery	7.8*	14.5	11.1	4.6
Primary Metals	7.7	15.7	20.8	24.2
Fabricated Metals	6.3	7.9	5.8	5.3
Stone, Clay and Glass	3.4	5.0	4.9	5.4
Nondurable Goods	25.7	25.0	31.0	32.0
Food and Kindred Products	8.4	8.1	13.5	16.7
Printing and Publishing	6.3	5.3	5.8	4.6
Apparel	2.3	3.3	4.4	2.1
Chemicals	3.7	3.9	2.9	2.5
Other Manufacturing	19.6	16.3	13.3	18.2
Total Manufacturing Earnings	100	100	100	100

* This sector was adversely effected by the recent reclassification of Unisys which resulted in a shift of 3,000 workers from the Machinery to Electronic Components Industry.

Source: Bureau of Economic Analysis, State Personal Income: 1929-87 and Survey of Current Business August 1990.

Table 8
Percent Distribution of Manufacturing Earnings
(1989)

State/Sectors	Percent	State/Sectors	Percent
<u>Arizona</u>		<u>Nevada</u>	
Electronic Components	24.4	Printing and Publishing	15.4
Transportation Equipment	18.7	Miscellaneous Manufacturing Products	10.6
Industrial Machinery	14.0	Stone, Clay and Glass Products	10.1
Instruments	7.8	Industrial Machinery	8.7
Printing and Publishing	7.0	Instruments	8.3
Other Manufacturing	28.1	Other Manufacturing	46.9
<u>Colorado</u>		<u>New Mexico</u>	
Industrial Machinery	20.4	Electronic Components	16.2
Electronic Components	12.0	Instruments	11.7
Transportation Equipment	11.9	Transportation Equipment	10.6
Food and Kindred Products	11.5	Industrial Machinery	8.1
Printing and Publishing	9.4	Printing and Publishing	7.2
Other Manufacturing	34.8	Other Manufacturing	46.2
<u>Idaho</u>		<u>Utah</u>	
Lumber	30.9	Transportation Equipment	21.3
Food and Kindred Products	22.0	Electronic Components	13.2
Industrial Machinery	11.5	Food and Kindred Products	8.4
Electronic Components	9.0	Industrial Machinery	7.8
Chemicals	8.0	Primary Metals	7.7
Other Manufacturing	18.6	Other Manufacturing	41.6
<u>Montana</u>		<u>Wyoming</u>	
Lumber	39.6	Petroleum and Coal Products	20.7
Food and Kindred Products	9.7	Printing and Publishing	13.6
Primary Metals	9.7	Chemicals	9.5
Printing and Publishing	7.9	Food and Kindred Products	9.5
Petroleum and Coal Products	6.5	Industrial Machinery	7.0
Other Manufacturing	26.6	Other Manufacturing	39.7

Source: Bureau of Economic Analysis, Survey of Current Business, August 1990, Table 3.

Major Manufacturers in the West

The location of large manufacturers in the West have helped shape the structure of the industry as well as determine the distinguishing characteristics of manufacturing in western states: Arizona--semiconductors and aircraft and aircraft engine production; Colorado--meat packing, computers and computer memory systems; Idaho--lumber, computers and semiconductors; New Mexico--aircraft avionics and semiconductors; Utah--space and missile propulsion units, primary metals, and semiconductors. Details on major companies, their products and date of location in the respective states appear in Table 9. This information was obtained from telephone interviews with public information officers from each company.

Summary

- Natural resources and transportation costs determined the early history of manufacturing in the western states. Prior to World War II, manufacturing in the West was characterized by the processing of products at smelters, slaughterhouses, mills, canneries and creameries.
- In 1946, manufacturing in the West accounted for only 8.3 percent of the total earnings in the region, compared to 26.6 percent for the manufacturing sector nationally. By 1989 the share of manufacturing earnings of total earnings for the eight western states had grown to 13.1 percent, compared to 19.7 percent nationally.
- Arizona's manufacturing sector has outperformed all other western states. Arizona's share of manufacturing earnings in the region has grown from 9.5 percent in 1946 to 30.6 percent in 1989.
- Within the region, manufacturing has a notable presence in four states: Arizona, Colorado, Idaho and Utah. Manufacturing represents 15 to 17 percent of earnings in each of these states. In the four remaining states -- Montana, Nevada, New Mexico and Wyoming -- manufacturing earnings range between 4 to 8 percent of total earnings.
- The 1950's and 1970's were periods of impressive manufacturing growth in the West with employment increasing 57 percent and 52 percent respectively. During the decade of the 1970's, manufacturing in the region grew by more than 193,000 jobs compared to only 94,000 jobs in the decade of the 1980's.

- The six postwar recessions have interrupted and slowed manufacturing growth in the West. For Utah, two non-recessionary periods have also impeded growth: 1963-1965 -- aerospace cutbacks by Department of Defense caused a loss of 10 percent of the state's manufacturing employment; 1985-1987 -- problems in the Primary Metals industry caused a loss of 2,500 jobs as Geneva Steel shut down, and modernization at Kennecott Copper reduced their workforce at smelters and mills. Despite these layoffs in the Primary Metals industry, Utah's manufacturing sector achieved greater employment increases than any other western state during the 1985-1990 period, in large part due to growth in aerospace employment.
- No other event in this century had the impact that World War II had on manufacturing in the West. The war spawned new industries compatible with locations in the western states, industries that were less dependent on proximity to markets and resources as well as less sensitive to transportation costs. Three such industries, computers, electronics and aerospace, have been the nucleus for the region's gains in postwar manufacturing. In 1989 the West, which has only 3 percent of total U.S. manufacturing employment, had 8.2 percent of the employment in the computer industry, 9.7 percent of the employment in the electronic components industry and 16.9 percent of the employment in the guided missile industry.

Table 9

Products, Beginning Date and Employees for 1991

	1991 Employment	Year Located
<u>Arizona</u>		
Semiconductors and Microprocessors		
Motorola	21,000	Since 1950
Intel	2,700	1980
Aircraft		
McDonnell Douglas (Commercial and DOD Helicopters)	4,800	1982
Honeywell Sperry (Guidance systems for helicopters and business jets)	6,000	1956
Aircraft Engines and Parts		
Garrett Division of Allied Signal Aerospace (Gas turbine engines, secondary turbine engines, pneumatic systems)	12,000	1951
<u>Colorado</u>		
Meat Packing		
Monfort Meat Packing	6,000	Prewar
Computers		
Hewlett Packard (Work stations and peripherals)	7,000	1963
Digital Equipment Corp (Disk drives and controllers)	3,400	Approx. 1965
Cray Computer (Supercomputer)	276	1988
Computer Memory Storage Systems		
Storage Technology	4,300	1969
Electronics Components		
Litton (Mobile tracking stations for aircraft)	650	1978
Texas Instruments (Defense electronics systems work)	700	1979
Unisys	650	1984
<u>Idaho</u>		
Logging, Sawmills, Planing Mills and Paper Products		
Boise Cascade	1,900	1957
Computer Peripherals		
Hewlett Packard (Disk Drives and printers)	4,000	1963
Frozen and Dehydrated Fruits and Vegetables		
J.R. Simplot	5,200	1940's
Ore-Ida Frozen Food (Frozen french fries)	1,000	1960
<u>New Mexico</u>		
Semiconductors		
Signetics	1,000	1982
Intel	1,500	1980
Search and Navigation Equipment		
Honeywell (Aircraft avionics)	1,500	1981
<u>Utah</u>		
Space Propulsion Units		
Thiokol	7,000	1958
Hercules ^a	3,000	1958
Semiconductors		
National Semiconductor	1,200	1977
Signetics	1,200	1967
Electronic Components		
Unisys ^b	3,000	1956
Primary Metals		
Geneva Steel	2,700	1947
Kennecott Minerals Company ^c	850	Prewar

^a Hercules Powder Company located in Utah in 1914. Hercules produced blasting powder for the copper and coal mines of Utah. In 1958 Hercules entered the aerospace business.

^b Originally Sperry Rand Corporation.

^c The employment figures reflect only those employees of Kennecott Minerals Company involved in milling and smelting of copper.

Definition of Manufacturing and Classification of Manufacturing Activity

Manufacturing is the "action or process of making articles or material by the application of physical labour or mechanical power"⁹. The Bureau of Labor Statistics has classified manufacturing activity according to industrial product. The first level of disaggregation is the two broad categories of Durable Goods and Nondurable Goods. The next level of disaggregation moves to the two-digit Standard Industrial Classifications (SIC) presented below. The two-digit classifications, however, only begin to detail the diversity of the manufacturing sector. Each two-digit classification is comprised of a multiplicity of industries further classified at the three- and four-digit level. Special mention must be made of four industries at the three-digit level that have played a crucial role in the development of manufacturing in the West: Computer and Office Equipment (SIC 357), Electronic Components and Accessories (SIC 367); Aircraft and Parts (SIC 372) and Guided Missiles, Space Vehicles and Parts (SIC 376). These industries have been identified in the list below:

⁹ The Oxford English Dictionary, Second Edition, Volume IX, Clarendon Press - Oxford, 1989.

Durable Goods

- SIC 24 Lumber & Wood Products
- 25 Furniture & Fixtures
- 32 Stone, Clay & Glass Products
- 33 Primary Metal Industries
- 34 Fabricated Metals Products
- 35 Industrial Machinery & Equipment
- 357 Computer & Office Equipment
- 36 Electronic & Other Electronic Equipment
- 367 Electronic Components and Accessories
- 37 Transportation Equipment
- 372 Aircraft and Parts
- 376 Guided Missiles, Space Vehicles and Parts
- 38 Instruments & Related Products
- 39 Misc. Manufacturing Industries

Nondurable Goods

- SIC 20 Food & Kindred Products
- 22 Textile Mill Products
- 23 Apparel & Other Textile Products
- 26 Paper & Allied Products
- 27 Printing & Publishing
- 28 Chemicals & Allied Products
- 29 Petroleum & Coal Products
- 30 Rubber & Misc. Plastics Products
- 31 Leather & Leather Products

Utah Business Statistics

UTAH DATA	Dec. 1989	Dec. 1990	% Change from Year Ago	12-Month Average This Year	12-Month Average Last Year	12-Month Average % Change
Total Personal Income (seasonally adjusted) (mil. of dol.) (qly.)	23,017	24,931	8.3%	24,263	22,353	8.5%
New Corporations (no.)	522	468	-10.3%	499	465	7.4%
New Car, Truck, and Motor Home Sales (no.)	4,177	3,915	-6.3%	5,102	5,058	0.9%
Agriculture -----						
Average Prices Recorded by Farmers (dol.)						
Beef Steers and Heifers (cwt) (thous.)	74.90	79.20	5.7%	76.64	72.46	5.8%
Lambs (cwt)	55.00	44.20	-19.6%	48.65	60.88	-20.1%
Milk Wholesale (cwt)	15.00	10.90	-27.3%	12.91	12.59	2.5%
Alfalfa Hay, Baled (per ton)	85.00	84.00	-1.2%	84.92	84.75	0.2%
Cattle Slaughtered (live weight) (thous. of lbs.)	44,789	43,471	-2.9%	47,014	47,990	-2.0%
Construction -----						
Total Construction (thous. of dol.) 1	90,293.0	53,401.7	-40.9%	82,746.7	79,934.9	3.5%
Residential	23,182.0	22,451.4	-3.2%	44,047.3	36,180.8	21.7%
Nonresidential	49,549.0	24,453.1	-50.6%	25,947.1	27,336.0	-5.1%
Additions, Alterations, and Conversions	17,562.0	6,497.2	-63.0%	12,752.3	16,418.1	-22.3%
Total Permit Construction (thous. of dol.) 2	83,128.5	65,965.3	-20.6%	103,814.3	84,042.3	23.5%
Residential	24,707.2	23,516.7	-4.8%	48,282.9	37,318.4	29.4%
Nonresidential	48,235.1	24,178.8	-49.9%	35,245.5	32,466.9	8.6%
Additions, Alterations, and Repairs	10,186.2	18,269.8	79.4%	20,285.9	14,257.0	42.3%
New Dwelling Units (no.)	328	281	-14.3%	584	469	24.4%
Employment -----						
Civilian Labor Force (thous.)	809.8	777.0	-4.1%	797.4	789.0	1.1%
Total Employed Persons	778.7	742.9	-4.6%	761.5	752.0	1.3%
Unemployed Persons	31.1	34.1	9.6%	36.0	37.0	-2.8%
Percent Total Labor Force	3.8	4.4	15.8%	4.5	4.7	-4.1%
Employees on Nonagricultural Payrolls (thous. of jobs)	717.3	747.5	4.2%	723.3	691.3	4.6%
Manufacturing	105.0	109.2	4.0%	106.1	103.1	2.9%
Mining	8.6	8.7	1.2%	8.6	8.1	6.1%
Contract Construction	26.0	28.1	8.1%	27.1	25.9	4.6%
Transportation, Communication, and Utilities	42.3	44.0	4.0%	42.8	40.9	4.7%
Wholesale Trade	39.3	39.6	0.8%	40.0	38.6	3.8%
Retail Trade	138.7	144.1	3.9%	135.7	127.9	6.2%
Finance, Insurance, and Real Estate	33.9	34.5	1.8%	34.1	33.4	2.2%
Services 3	174.7	187.1	7.1%	179.3	167.2	7.2%
Federal Government	39.4	37.9	-3.8%	39.6	40.0	-1.0%
State Government 4	40.6	42.1	3.7%	41.8	40.1	4.1%
Local Government 4	68.6	71.7	4.5%	68.0	66.2	2.8%
Average Weekly Hours						
Manufacturing	40.7	40.2	-1.2%	39.9	40.0	-0.3%
Mining	41.3	44.7	8.2%	43.8	41.0	6.9%
Wholesale Trade	36.1	37.1	2.8%	37.4	37.5	-0.2%
Retail Trade	28.1	26.5	-5.7%	26.6	27.4	-2.9%
Amount of Unemployment Compensation (thous. of dol.)	5,704.1	4,996.7	-12.4%	4,892.2	5,106.7	-4.2%
Finance -----						
Savings, Savings and Loan Association (mil. of dol.)	2,117.8	1,155.5	-45.4%	1,623.7	2,192.8	-26.0%
Tax Collections by the State of Utah (thous. of dol.)						
Total Tax Collections	94,950.6	NA	NA	NA	158,011.4	NA
Sales and Use Tax	3,236.2	NA	NA	NA	56,794.0	NA
Motor Fuel Tax	9,232.4	NA	NA	NA	11,515.9	NA
Individual Income Tax	63,444.8	NA	NA	NA	52,969.7	NA
Corporation Franchise Tax	493.4	NA	NA	NA	5,371.1	NA
Production -----						
Crude Oil to Refineries (thous. of bbls.)	3,750.5	3,669.5	-2.2%	3,605.6	3,895.4	-7.4%
Crude Oil (thous. of bbls.)	2,408.7	2,235.7	-7.2%	2,291.7	2,354.0	-2.6%
Natural Gas (mil. of cu. ft.)	26,101.9	28,676.2	9.9%	26,636.2	23,044.7	15.6%
Coal (thous. short tons)	1,889.0	1,805.0	-4.4%	1,944.5	1,700.8	14.3%
Tourism/Travel -----						
Air Passengers (total no. on and off)(S.L. Int'l Airport)	999,137	1,010,879	1.2%	998,529	990,694	0.8%
Highway Traffic Count Across State Lines	41,914	44,930	7.2%	44,035	38,856	13.3%
Transient Room Tax (thous. of dol.)	-253.5	NA	NA	NA	557.0	NA
Visits, State, Nat'l. Parks, Monuments (thous.)	282.6	276.7	-2.1%	1,112.4	1,111.6	0.1%
Utilities -----						
Telephone Lines in Service (Mt. Bell)(Residential)	509,086	527,551	3.6%	517,155	500,607	3.3%
Telephone Lines in Service (Mt. Bell)(Nonresidential)	187,570	200,469	6.9%	195,073	185,918	4.9%
Electric Customers (Residential)	488,185	NA	NA	NA	484,158	NA
Electric Customers (Commercial)	48,733	NA	NA	NA	48,158	NA
Natural Gas Customers (Residential & Commercial)	480,735	493,313	2.6%	486,655	473,242	2.8%
Natural Gas Customers (Industrial)	565	579	2.5%	573	565	1.5%

Utah Business Statistics

UTAH DATA	Dec. 1989	Dec. 1990	% Change from Year Ago	12-Month Average This Year	12-Month Average Last Year	12-Month Average % Change
Davis County -----						
Non-Ag. Employment (thous.)	57.7r	60.6	5.0%	59.0	56.7	4.1%
Unemployment Rate	4.3r	4.4	2.3%	4.3	4.3	-1.5%
Auth. Permit Construction (thous. of dol.)	5,543.9	5,262.1	-5.1%	10,788.5	10,089.3	6.9%
New Dwelling Units (no.)	29	41	41.4%	79	67	18.2%
Postal Receipts (thous. of dol.)	681.3	933.4	37.0%	661.5	618.6	6.9%
Electric Customers (Residential)	49,581	50,398	1.6%	50,021	49,062	2.0%
Electric Customers (Commercial)	3,647	3,739	2.5%	3,696	3,620	2.1%
Natural Gas Customers (Residential)	52,323	53,625	2.5%	52,995	51,818	2.3%
Natural Gas Customers (Industrial)	55	56	1.8%	56	55	1.7%
Telephone Lines in Service (Mt. Bell)(Residential)	57,734	61,309	6.2%	60,378	56,973	6.0%
Telephone Lines in Service (Mt. Bell)(Nonresidential)	12,254	13,055	6.5%	12,843	11,983	7.2%
Salt Lake County -----						
Non-Ag. Employment (thous.)	366.2r	381.6	4.2%	368.0	352.9	4.3%
Unemployment Rate	3.7r	3.7	0.0%	4.0	4.2	-5.3%
Auth. Permit Construction (thous. of dol.)	53,385.7	28,827.2	-46.0%	46,791.4	36,654.7	27.7%
New Dwelling Units (no.)	126	91	-27.8%	202	164	23.0%
Postal Receipts (thous. of dol.)	8,989.8	8,589.5	-4.5%	7,988.2	8,209.0	-2.7%
Electric Customers (Residential)	245,500	249,030	1.4%	246,723	243,239	1.4%
Electric Customers (Commercial)	21,061	21,259	0.9%	21,191	20,906	1.4%
Natural Gas Customers (Residential)	226,484	230,947	2.0%	228,746	224,784	1.8%
Natural Gas Customers (Industrial)	246	248	0.8%	246	243	1.2%
Telephone Lines in Service (Mt. Bell)(Residential)	239,112	248,277	3.8%	243,607	235,345	3.5%
Telephone Lines in Service (Mt. Bell)(Nonresidential)	114,181	120,942	5.9%	118,200	112,946	4.7%
Utah County -----						
Non-Ag. Employment (thous.)	92.9r	97.9	5.4%	93.3	87.0	7.2%
Unemployment Rate	4.5r	3.6	-20.0%	3.8	4.2	-10.2%
Auth. Permit Construction (thous. of dol.)	9,165.9	16,890.4	84.3%	17,518.1	12,539.0	39.7%
New Dwelling Units (no.)	41	52	26.8%	108	74	45.8%
Postal Receipts (thous. of dol.)	1,826.2	1,688.2	-7.6%	1,686.6	1,438.1	17.3%
Electric Customers (Residential)	53,509	NA	NA	NA	53,208	NA
Electric Customers (Commercial)	6,398	NA	NA	NA	6,165	NA
Natural Gas Customers (Residential)	63,895	65,588	2.6%	64,590	63,131	2.3%
Natural Gas Customers (Industrial)	74	74	0.0%	74	74	0.0%
Telephone Lines in Service (Mt. Bell)(Residential)	67,398	68,604	1.8%	67,100	66,315	1.2%
Telephone Lines in Service (Mt. Bell)(Nonresidential)	19,790	21,665	9.5%	20,947	20,768	0.9%
Weber County -----						
Non-Ag. Employment (thous.)	64.6r	66.5	2.9%	66.6	63.9	4.2%
Unemployment Rate	5.5r	6.0	9.1%	5.6	5.5	1.4%
Auth. Permit Construction (thous. of dol.)	5,551.2	2,126.6	-61.7%	6,447.5	6,261.5	3.0%
New Dwelling Units (no.)	53	17	-67.9%	40	46	-12.7%
Postal Receipts (thous. of dol.)	925.5	897.1	-3.1%	728.5	687.4	6.0%
Electric Customers (Residential)	54,636	55,209	1.0%	54,879	54,259	1.1%
Electric Customers (Commercial)	5,074	5,065	-0.2%	5,100	5,032	1.3%
Natural Gas Customers (Residential)	50,991	51,873	1.7%	51,389	50,613	1.5%
Natural Gas Customers (Industrial)	83	81	-2.4%	82	84	-2.2%
Telephone Lines in Service (Mt. Bell)(Residential)	47,910	47,601	-0.6%	47,050	47,409	-0.8%
Telephone Lines in Service (Mt. Bell)(Nonresidential)	12,512	13,396	7.1%	13,217	12,263	7.8%

1 Obtained from U.S. Bureau of the Census Construction Statistics Division.

2 Obtained from *Utah Construction Report*.

3 Includes services by nonprofit and religious organizations.

4 Includes public schools and college institutions.

NA

r

Not Available

Revised

Sources:

Personal Income	U.S. Department of Commerce, Bureau of Economic Analysis.
New Corporations	Utah Secretary of State.
New Car and Truck Sales	Utah State Tax Commission, Economic and Statistical Unit.
Agriculture	U.S. Department of Agriculture, Utah Agricultural Statistics Service, <i>Utah Agriculture</i> .
Construction Data	U.S. Bureau of the Census and Bureau of Economic and Business Research, <i>Utah Construction Report</i> .
Employment Data	Utah Department of Employment Security.
Savings Information	Utah Savings and Loan Institutions.
Tax Collections	Utah State Tax Commission.
Crude Oil Production	Utah Department of Oil, Gas, and Mining and Area Oil Refineries.
Natural Gas Production	Utah Department of Oil, Gas, and Mining.
Coal Production	U.S. Department of Energy.
Air Passengers	Salt Lake City International Airport, Statistics Division.
Highway Traffic Count	Utah Department of Transportation.
Visits to State and National Parks and Monuments	U.S. Forest Service, Utah State Parks and Recreation Department.
Utilities Data	Cooperating Utah Utility Companies.
Postal Receipts	Postmasters in Davis, Salt Lake, Utah, and Weber Counties.

**Bureau of Economic and
Business Research
University of Utah
Salt Lake City, Utah 84112
Return Postage Guaranteed
(Non-Profit Organization)**

**Non-Profit Org.
U.S. Postage Paid**

**Permit No. 1529
Salt Lake City, Utah**

NATIONAL DATA	Dec. 1989	Dec. 1990	% Change from Year Ago	12-Month Average This Year	12-Month Average Last Year	12-Month Average % Change
U.S. Gross National Product (seasonally adjusted) (bil.) (qly.)	5,289.3	5,527.3	4.5%	5,465.2	5,200.8	5.1%
Total Personal Income (seasonally adjusted) (bil. of dol.)	4,496.7	4,743.3	5.5%	4,645.5	4,384.3	6.0%
Industrial Production Indexes (seasonally adjusted) (1987=100)	108.6	107.2	-1.3%	109.2	108.1	1.0%
New Plant and Equipment Expenditures by Business (bil.) (qly.)	519.6	532.8	2.5%	533.9	506.0	5.5%
Net Exports of Goods and Services (bil.) (qly.)	-35.3	-28.8	-18.4%	-31.3	-46.1	-32.2%
Exports of Goods and Services (bil.) (qly.)	642.8	697.4	8.5%	672.8	626.3	7.4%
Imports of Goods and Services (bil.) (qly.)	678.1	726.2	7.1%	704.1	672.3	4.7%
Index of Leading Indicators (1982=100)	145.3	139.7	-3.9%	143.9	144.9	-0.7%
Price Indexes						
Consumer Price Indexes (not seasonally adjusted) (1982-84=100)						
CPI-U (All Urban Consumers) All Items	126.1	133.8	6.1%	130.7	124.0	5.4%
CPI-U (All Urban Consumers) Food & Beverages	127.2	133.9	5.3%	132.1	124.9	5.8%
CPI-U (All Urban Consumers) Housing	124.9	130.5	4.5%	128.5	123.0	4.5%
CPI-U (All Urban Consumers) Transportation	115.2	127.2	10.4%	120.5	114.1	5.6%
CPI-U (All Urban Consumers) Medical Care	154.4	169.2	9.6%	162.8	149.3	9.1%
CPI-U (All Urban Consumers) Energy	93.2	110.1	18.1%	102.1	94.3	8.2%
Producer Price Index (not seasonally adjusted) (1982=100)						
Producer Price Index, All Finished Goods	115.3	121.9	5.7%	119.1	113.5	4.9%
GNP Price Deflator (1982=100) (qly.)	128.0	133.1	4.0%	131.5	126.3	4.1%
Civilian Employment (seasonally adjusted)						
Total Civilian Labor Force (mil.)	124.5	125.2	0.6%	124.8	123.8	0.8%
Total Civilian Employment (mil.)	118.0	117.6	-0.3%	117.9	117.3	0.5%
Unemployment Rate	5.3	6.1	15.1%	5.5	5.3	5.1%
Construction						
Total Construction (mil. of dol.)	18,814.0	13,405.0	-28.7%	19,280.7	22,462.0	-14.2%
Residential	7,442.0	5,308.0	-28.7%	8,750.3	10,203.0	-14.2%
Nonresidential	8,006.0	5,393.0	-32.6%	6,741.5	8,185.4	-17.6%
Non-Building	3,365.0	2,704.0	-19.6%	3,788.9	4,073.5	-7.0%
New Dwelling Units (no.)	84,551	56,574	-33.1%	94,150	115,044	-18.2%
Interest Rates						
Federal Funds Rate	8.45	7.31	-13.5%	8.10	9.22	-12.1%
Short Term (3-month Treasury bill rate)	7.64	6.81	-10.9%	7.51	8.12	-7.5%
Long Term (30-year Treasury bond yields)	8.02	8.31	3.6%	8.73	8.59	1.7%
Prime Rates Charged by Banks on Short-term Business Loans (avg.)	10.50	10.00	-4.8%	10.01	10.87	-7.9%
Mortgage Rates (new homes)	9.70	9.45	-2.6%	9.68	9.76	-0.8%

Sources: *Survey of Current Business*, U.S. Department of Commerce: U.S. Gross National Product, Total Personal Income, Industrial Production Indexes, New Plant and Equipment Expenditures by Business, Export/Import Data, Index of Leading Indicators, GNP Price Deflator, National Employment Data, Interest Rates.

F.W. Dodge Report, McGraw-Hill: National Construction Data.

Monthly Labor Review, U.S. Department of Labor, Bureau of Labor Statistics: Consumer Price Indexes, Producer Price Index.

Chase N. Peterson, President, University of Utah
John Seybolt, Dean, Graduate School of Business

BUREAU OF ECONOMIC AND BUSINESS RESEARCH

R. Thayne Robson, Director
Frank C. Hachman, Associate Director



STAFF OF THE BUREAU OF ECONOMIC AND BUSINESS RESEARCH

Office Staff

Marl Lou Wood, Office Manager
Cathy Crawford, Administrative Assistant
Diane Gillam, Associate Accountant
Lee Carberry, Administrative Secretary
Gaylene Roethel, Administrative Secretary

Senior Research Economists

Boyd L. Fjeldsted

Production Staff

James B. Peters, Graphics

Research Analysts, Research Assistants and Programmers

Jan Crispin-Little
Jade Crittenden
Michael Fordham
Gary Ricks
Austin Sargent
James Wood