

A second look at industry output and employment trends through 1995

In new BLS projections, the shift of employment from manufacturing to services in coming years is more pronounced, but manufacturing output continues to be an important factor in GNP growth

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New projections prepared by the Bureau of Labor Statistics show that, under a certain set of macroeconomic assumptions, total employment will reach almost 123 million in 1995, a gain of nearly 16 million jobs from 1984. Almost 9 out of every 10 of these new jobs will be added in a service-producing industry (transportation, communications, public utilities, trade, finance, insurance, real estate, miscellaneous services, and government). The remainder are projected to be goods-producing jobs (manufacturing, construction, mining, and agriculture).

One component of the broadly defined service-producing sector, the miscellaneous services sector (which includes business, personal, and medical services), will account for almost half of the 16 million new jobs. Growth in miscellaneous services between 1984 and 1995 is projected to be almost double the average rate of 1.3 percent for the economy as a whole. By 1995, this sector is expected to account for more than 1 out of every 4 jobs in the U.S. economy.

The Bureau has developed three alternative sets of economic and employment projections for the year 1995. The macroeconomic assumptions underlying these projections, which consist of a high-growth, moderate-growth, and low-growth scenario, are described by Bureau economist Betty Su on pp. 3–16 of this issue. This article focuses on the employment and output of the middle projection, with the two alternatives described later.

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Overview

The business services industry is projected to have the most new jobs and the second-fastest rate of growth among the 149 industries studied.¹ The continued shift toward contracting out some firm operations and growth in demand for computer software and other types of modern business services are factors underlying this development.

Jobs in durable manufacturing industries are projected to rise by 1.5 million, but this gain will be partly offset by a 0.1 million decline in nondurable goods jobs. Employment in manufacturing is projected to just top 21 million by 1995, slightly below its 1979 peak.

Although manufacturing employment shows only modest growth between 1984 and 1995, the value of output in manufacturing is projected to rise rapidly. Under the assumptions of the moderate-growth scenario, the capital spending boom of 1984 will continue; exports of manufactured goods will grow rapidly after the current imbalances in international exchange rates equilibrate; and defense demand will continue strong at least through 1990. These factors spur production in manufacturing to a 3.0-percent yearly increase, compared to 2.9 percent for real GNP as a whole. The rise in manufacturing output without corresponding increases in employment occurs because of the projected faster rate of advance in productivity in this sector.

The projection of total employment of 122.8 million in 1995 represents growth averaging 1.5 percent a year from 1984 to 1990 and 1.0 percent during 1990–95. In the earlier years, there is still some residual recovery from the 1980–

82 recessionary period, but this is followed by a long-term slowdown in employment growth related to a decline in labor force growth. The deceleration of the labor force actually began in 1979, as the first members of the smaller birth cohort from the "baby bust" of the late 1960's reached working age. (Howard N Fullerton provides a complete discussion of this point in his article on pp. 17–25 of this issue.)

Of the 122.8 million employment level projected for 1995, 8.9 million workers are expected to be nonagricultural self-employed and unpaid family workers. The number of self-employed persons has been rising in recent years, especially during the cyclical downswing. When new hiring is tight, some people go into business for themselves or supplement their salaried jobs with side businesses. Most self-employed jobs are concentrated in trade or service industries. Despite the shrinking importance of the cyclical factor, the projected continued shift to service sector employment will contribute to the growth of self-employment—by increasing the demand for business and professional consultants, for example.

Overall, GNP is projected to expand by 3.0 percent a year to 1990, slowing to 2.8 percent between 1990 and 1995. A steady economy is assumed, with no business cycle fluctuations or major economic upheavals. The civilian unemployment rate is projected to drop from 7.5 percent in 1984 to 6.3 percent in 1990 and 6.0 percent in 1995.

Where will the new jobs be?

From 1959 to 1984, the U.S. economy added nearly 40 million jobs, one-half of them during the 1969–79 period. As has been well documented, service-producing industries, especially the other services sector, have absorbed ever increasing proportions of this rapidly expanding work force. Goods-producing industries, on the other hand, have declined in importance as employment sources, although they still contribute a sizable share to GNP. Manufacturing jobs were 25.1 percent of all jobs in 1959, but only 18.5 percent by 1984. (See table 1.) Other services, in contrast, accounted for 14.1 percent of total employment in 1959 and 22.4 percent in 1984. While manufacturing gained almost 3 million jobs over the 1959–84 period, this growth was dwarfed by the 14 million added in the other services sector.

However, simply looking at jobs somewhat overemphasizes the restructuring of the U.S. economy. In terms of output, the restructuring has been far more modest. (See table 2.) Manufacturing production represented 26.6 percent of private GNP in 1959, rose to a high of 29.7 percent during the peak of the Vietnam war buildup, and then tapered slowly to 25.7 percent by 1984. Overall, the manufacturing share of output dropped less than 1 percentage point over the 25-year span 1959–84, compared with a 6.6-percentage-point decline in its share of total jobs.

Other important employment shifts over the 25-year period included the shrinkage of the agricultural sector, with

an absolute decline of 2.3 million jobs and a drop in share of total employment from 8.2 percent to 3.1 percent. Government jobs (Federal, State, and local) increased from less than 12 percent of total employment in 1959 to 15.7 percent in 1979. However, since then the public sector share of the total has fallen, although employment levels have not changed much.

Many of the shifts seen over the last 25 years are projected to continue to 1995. The employment shift to services is one of these, with jobs in industries such as business services, health care, professional services, and others accounting for 25.4 percent of all jobs by 1995. Similarly, government employment is projected to grow modestly in absolute levels but to decline as a share of total employment, continuing the trend started in the late 1970's. Chart 1 illustrates the relative employment growth of some of the major sectors.

Business services. The business services industry is projected to lead all others in numbers of new jobs and to rank second in terms of rate of employment growth. (See table 3.) This is the case despite the relatively small size of the industry compared to some others, such as retail trade, eating and drinking places, wholesale trade, and new construction. Each of these other industries had more employment than business services in 1984—in fact, retail trade was almost three times as large—but they will add smaller numbers of new jobs through 1995 than business services. More than 2.6 million new business service jobs are projected to be added to 1984's level of 4.6 million, an annual growth rate of 4.2 percent. Table 4 shows employment projections for detailed business service industries.

The expansion of the business services industry has been tremendous over the past few decades, with real output increasing fivefold over the past 20 years and employment quadrupling. Growth has been spurred by a combination of factors. First, many new types of services have now become integral parts of modern business operations. The computer and other technological advances have led to demand for programming and software services and for a whole range of consulting and management services. Security services have become widespread as organizations attempt to curb high insurance premiums and uninsured losses. Requirements for temporary help have expanded beyond clerical jobs to include technical and professional occupations. These and other new types of services have been introduced or have expanded in recent years and are now necessary in the operations of many firms.

Second, firms have found it more efficient to contract out many of these services rather than rely on in-house staff. An outside contractor can maintain a large specialized staff and enjoy economies of scale not possible for each individual firm. For permanent operations, such as security or janitorial services, overhead and management expenses are reduced by contracting out,² and for one-time or infrequent

Table 1. Employment by major sector, 1959–95

Economic sector	Employment (in thousands) ¹											
	Actual				Projected							
	1959	1969	1979	1984	1990			1995				
					Low	Moderate	High	Low	Moderate	High		
Total	67,784	81,508	101,471	106,841	112,797	116,865	119,020	117,268	122,760	127,719		
Agriculture	5,583	3,622	3,340	3,293	3,125	3,164	3,201	2,971	3,059	3,128		
Nonagriculture	62,201	77,886	98,131	103,548	109,672	113,701	115,819	114,297	119,700	124,591		
Government (including enterprises)	8,083	12,195	15,947	15,984	16,465	16,596	16,795	16,820	17,144	17,592		
Federal	2,233	2,758	2,773	2,807	2,790	2,790	2,790	2,800	2,800	2,800		
State and local	5,850	9,437	13,174	13,177	13,675	13,806	14,005	14,020	14,344	14,792		
Private	54,118	65,691	82,184	87,564	93,207	97,105	99,024	97,477	102,556	106,999		
Mining	614	501	704	651	633	659	676	600	631	661		
Construction	3,910	4,374	5,879	5,920	5,910	6,189	6,276	6,331	6,636	6,856		
Manufacturing	17,018	20,467	21,401	19,779	20,063	20,913	21,320	20,089	21,124	22,037		
Durable	9,582	12,080	12,985	11,744	12,349	12,872	13,122	12,568	13,216	13,788		
Nondurable	7,436	8,387	8,416	8,035	7,714	8,041	8,198	7,521	7,908	8,249		
Transportation, communications, and public utilities ²	4,255	4,637	5,414	5,500	5,726	5,957	6,065	5,996	6,304	6,586		
Trade	13,492	16,671	22,311	24,290	25,991	27,106	27,706	26,848	28,272	29,545		
Finance, insurance, and real estate	2,959	3,859	5,514	6,296	6,699	6,991	7,146	7,024	7,397	7,716		
Services	9,591	13,326	19,635	23,886	27,080	28,142	28,662	29,607	31,170	32,537		
Private households	2,279	1,856	1,326	1,242	1,106	1,148	1,174	982	1,023	1,060		
Percent distribution												
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
Agriculture	8.2	4.4	3.3	3.1	2.8	2.7	2.7	2.5	2.5	2.4		
Nonagriculture	91.8	95.6	96.7	96.9	97.2	97.3	97.3	97.5	97.5	97.6		
Government (including enterprises)	11.9	15.0	15.7	15.0	14.6	14.2	14.1	14.3	14.0	13.8		
Federal	3.3	3.4	2.7	2.6	2.5	2.4	2.3	2.4	2.3	2.2		
State and local	8.6	11.6	13.0	12.3	12.1	11.8	11.8	12.0	11.7	11.6		
Private	79.8	80.6	81.0	82.0	82.6	83.1	83.2	83.1	83.5	83.8		
Mining	.9	.6	.7	.6	.6	.6	.6	.5	.5	.5		
Construction	5.8	5.4	5.8	5.5	5.2	5.3	5.3	5.4	5.4	5.4		
Manufacturing	25.1	25.1	21.1	18.5	17.8	17.9	17.9	17.1	17.2	17.3		
Durable	14.1	14.8	12.8	11.0	10.9	11.0	11.0	10.7	10.8	10.8		
Nondurable	11.0	10.3	8.3	7.5	6.8	6.9	6.9	6.4	6.4	6.5		
Transportation, communications, and public utilities ²	6.3	5.7	5.3	5.1	5.1	5.1	5.1	5.1	5.1	5.2		
Trade	19.9	20.5	22.0	22.7	23.0	23.2	23.3	22.9	23.0	23.1		
Finance, insurance, and real estate	4.4	4.7	5.4	5.9	5.9	6.0	6.0	6.0	6.0	6.0		
Services	14.1	16.3	19.4	22.4	24.0	24.1	24.1	25.2	25.4	25.5		
Private households	3.4	2.3	1.3	1.2	1.0	1.0	1.0	.8	.8	.8		
Average annual rate of change												
	1959–69	1969–79	1979–84	1984–90			1990–95			1984–95		
				Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Total	1.9	2.2	1.0	0.9	1.5	1.8	0.8	1.0	1.4	0.9	1.3	1.6
Agriculture	-4.2	-.8	-.3	-.9	-.7	-.5	-1.0	-.7	-.5	-.9	-.7	-.5
Nonagriculture	2.3	2.3	1.1	1.0	1.6	1.9	.8	1.0	1.5	.9	1.3	1.7
Government (including enterprises)	4.2	2.7	.0	.5	.6	.8	.4	.7	.9	.5	.6	.9
Federal	2.1	.1	.2	-.1	-.1	.1	.1	.1	.1	.0	.0	.0
State and local	4.9	3.4	.0	.6	.8	1.0	.5	.8	1.1	.6	.8	1.1
Private	2.0	2.3	1.3	1.0	1.7	2.1	.9	1.1	1.6	1.0	1.4	1.8
Mining	-2.0	3.5	-1.6	-.5	.2	.6	-1.0	-.9	-.4	-.7	-.3	.1
Construction	1.1	3.0	.1	.0	.7	1.0	1.4	1.4	1.8	.6	1.0	1.3
Manufacturing	1.9	.4	-1.6	.2	.9	1.3	.0	.2	.7	.1	.6	1.0
Durable	2.3	.7	-2.0	.8	1.5	1.9	.4	.5	1.0	.6	1.1	1.5
Nondurable	1.2	.0	-.9	-.7	.0	.3	-.5	-.3	.1	-.6	-.1	.2
Transportation, communications, and public utilities ²	.9	1.6	.3	.7	1.3	1.6	.9	1.1	1.7	.8	1.2	1.7
Trade	2.1	3.0	1.7	1.1	1.8	2.2	.7	.8	1.3	.9	1.4	1.8
Finance, insurance, and real estate	2.7	3.6	2.7	1.0	1.8	2.1	1.0	1.1	1.5	1.0	1.5	1.9
Services	3.3	4.0	4.0	2.1	2.8	3.1	1.8	2.1	2.6	2.0	2.4	2.8
Private households	-2.0	-3.3	-1.3	-1.9	-1.3	-.9	-2.4	-2.3	-2.0	-2.1	-1.7	-1.4

¹Includes wage and salary jobs, the self-employed, and unpaid family workers.

²Does not match detail in table 7 because these estimates exclude public electric utilities.

operations, it is often quicker and cheaper to hire outside expertise than to develop it in-house. Contracting out for the proliferating new services required in today's economy has strongly spurred employment growth in the business services industry.

The future of the industry depends on the same types of trends: new operations coming into importance and being

performed by specialized firms. However, demand for some types of contract business services may be approaching saturation, and growth for these is, as a consequence, projected to be more modest than for the industry as a whole. Examples include detective and protective services and services to buildings. Employment will continue to expand faster in these areas than in most other sectors of the econ-

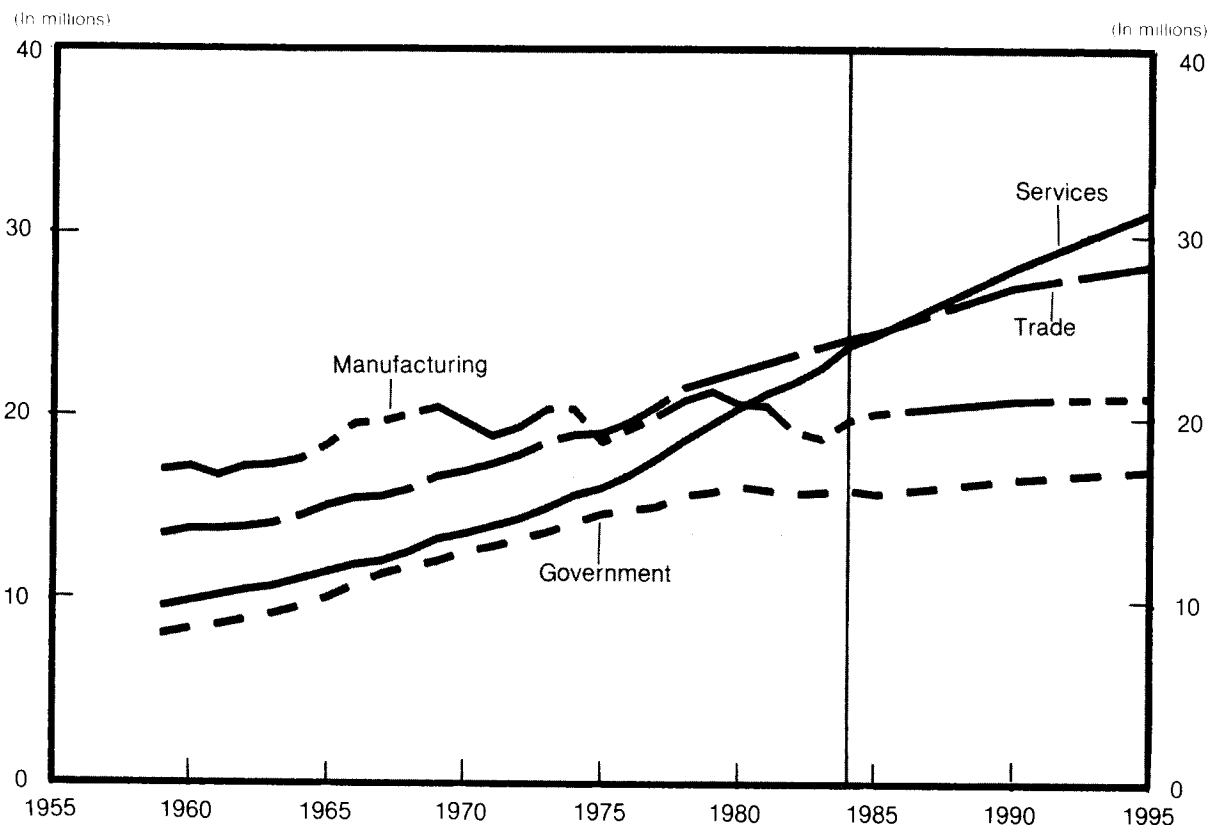
Table 2. Gross product originating by major sector, 1959-95

Economic sector	Billions of 1977 dollars											
	Actual				Projected							
	1959	1969	1979	1984	1990			1995				
					Low	Moderate	High	Low	Moderate	High		
Total private	\$879.3	\$1,333.8	\$1,860.4	\$2,077.9	\$2,465.3	\$2,593.5	\$2,756.1	\$2,776.4	\$3,005.1	\$3,312.4		
Agriculture	44.7	47.8	56.8	65.9	70.0	73.8	78.2	73.5	80.7	88.5		
Nonagriculture	834.6	1,286.0	1,803.6	2,012.0	2,395.3	2,519.7	2,677.9	2,702.9	2,924.4	3,223.9		
Mining	32.7	44.8	51.2	55.0	56.3	60.1	64.5	57.5	64.8	72.6		
Construction	71.3	87.4	91.3	85.7	97.7	100.6	103.5	107.3	113.3	118.2		
Manufacturing	233.7	378.2	500.8	533.9	608.3	643.5	693.3	669.3	738.6	827.4		
Durable	137.6	232.1	304.5	324.5	380.7	403.5	437.4	426.5	472.3	532.2		
Nondurable	96.1	146.1	196.3	209.4	227.6	240.0	255.9	242.8	266.3	295.2		
Transportation, communications, and public utilities	76.9	127.9	190.0	202.8	248.2	260.0	278.4	286.3	310.5	341.0		
Transportation	41.7	60.5	78.5	69.8	77.2	80.9	85.8	83.6	90.6	99.0		
Communications	13.6	28.3	58.0	75.0	107.6	112.6	121.7	134.7	145.8	160.6		
Public utilities	21.6	39.1	53.5	58.0	63.4	66.5	70.9	68.0	74.1	81.4		
Trade	160.7	242.3	350.2	411.6	457.2	476.1	506.2	494.1	532.3	584.0		
Wholesale	60.6	101.8	153.5	187.0	205.7	215.6	228.5	220.5	240.4	263.6		
Retail	100.1	140.5	196.7	224.6	251.5	260.5	277.7	273.6	291.9	320.4		
Finance, insurance, and real estate	129.3	200.5	300.9	347.8	427.5	442.6	474.1	493.2	523.1	576.8		
Services ¹	116.7	179.0	264.0	315.5	378.9	394.6	418.0	430.8	461.9	503.7		
Government enterprises	16.0	22.9	28.8	29.4	33.1	34.5	36.6	36.2	38.8	42.6		
Rest of world and statistical discrepancy	-2.7	3.0	26.4	30.3	88.1	107.7	103.3	128.2	141.1	157.6		
	Percent distribution											
	1959	1969	1979	1984	1990			1995				
					Low	Moderate	High	Low	Moderate	High		
Total private	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
Agriculture	5.1	3.6	3.1	3.2	2.8	2.8	2.8	2.6	2.6	2.7		
Nonagriculture	94.9	96.4	96.9	96.8	97.2	97.2	97.2	97.4	97.4	97.3		
Mining	3.7	3.4	2.8	2.6	2.3	2.3	2.3	2.1	2.2	2.2		
Construction	8.1	6.6	4.9	4.1	4.0	3.9	3.8	3.9	3.8	3.6		
Manufacturing	26.6	28.4	26.9	25.7	24.7	24.8	25.2	24.1	24.6	25.0		
Durable	15.6	17.4	16.4	15.6	15.4	15.6	15.9	15.4	15.7	16.1		
Nondurable	10.9	11.0	10.6	10.1	9.2	9.3	9.3	8.7	8.9	8.9		
Transportation, communications, and public utilities	8.7	9.6	10.2	9.8	10.1	10.0	10.1	10.3	10.3	10.3		
Transportation	4.7	4.5	4.2	3.4	3.1	3.1	3.1	3.0	3.0	3.0		
Communications	1.5	2.1	3.1	3.6	4.4	4.3	4.4	4.9	4.8	4.8		
Public utilities	2.5	2.9	2.9	2.8	2.6	2.6	2.6	2.4	2.5	2.5		
Trade	18.3	18.2	18.8	19.8	18.5	18.4	18.4	17.8	17.7	17.6		
Wholesale	6.9	7.6	8.3	9.0	8.3	8.3	8.3	7.9	8.0	8.0		
Retail	11.4	10.5	10.6	10.8	10.2	10.0	10.1	9.9	9.7	9.7		
Finance, insurance, and real estate	14.7	15.0	16.2	16.7	17.3	17.1	17.2	17.8	17.4	17.4		
Services ¹	13.3	13.4	14.2	15.2	15.4	15.2	15.2	15.5	15.4	15.2		
Government enterprises	1.8	1.7	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3		
Rest of world and statistical discrepancy	- .3	.2	1.4	1.5	3.6	4.2	3.7	4.6	4.7	4.8		
	Average annual rate of change											
	1959-69	1969-79	1979-84	1984-90			1990-95			1984-95		
				Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Total private	4.3	3.4	2.2	2.9	3.8	4.8	2.4	3.0	3.7	2.7	3.4	4.3
Agriculture	.7	1.7	3.0	1.0	1.9	2.9	1.0	1.8	2.5	1.1	1.8	2.7
Nonagriculture	4.4	3.4	2.2	2.9	3.8	4.9	2.4	3.0	3.8	2.7	3.5	4.4
Mining	3.2	1.3	1.4	.4	1.5	2.7	.4	1.5	2.4	.4	1.5	2.6
Construction	2.1	.4	-1.3	2.2	2.7	3.2	1.9	2.4	2.7	2.1	2.6	3.0
Manufacturing	4.9	2.8	1.3	2.2	3.2	4.5	1.9	2.8	3.6	2.1	3.0	4.1
Durable	5.4	2.8	1.3	2.7	3.7	5.1	2.3	3.2	4.0	2.5	3.5	4.6
Nondurable	4.3	3.0	1.3	1.4	2.3	3.4	1.3	2.1	2.9	1.4	2.2	3.2
Transportation, communications, and public utilities	5.2	4.0	1.3	3.4	4.2	5.4	2.9	3.6	4.1	3.2	3.9	4.8
Transportation	3.8	2.6	-2.3	1.7	2.5	3.5	1.6	2.3	2.9	1.6	2.4	3.2
Communications	7.6	7.4	5.3	6.2	7.0	8.4	4.6	5.3	5.7	5.5	6.2	7.1
Public utilities	6.1	3.2	1.6	1.5	2.3	3.4	1.4	2.2	2.8	1.5	2.3	3.1
Trade	4.2	3.8	3.3	1.8	2.5	3.5	1.6	2.3	2.9	1.7	2.4	3.2
Wholesale	5.3	4.2	4.0	1.6	2.4	3.4	1.4	2.2	2.9	1.5	2.3	3.2
Retail	3.4	3.4	2.7	1.9	2.5	3.6	1.7	2.3	2.9	1.8	2.4	3.3
Finance, insurance, and real estate	4.5	4.1	2.9	3.5	4.1	5.3	2.9	3.4	4.0	3.2	3.8	4.7
Services ¹	4.4	4.0	3.6	3.1	3.8	4.8	2.6	3.2	3.8	2.9	3.5	4.3
Government enterprises	3.7	2.3	.4	2.0	2.7	3.7	1.8	2.4	3.1	1.9	2.6	3.4
Rest of world and statistical discrepancy	(²)	24.3	2.8	19.5	23.5	22.7	7.8	5.6	8.8	14.0	15.0	16.2

¹Includes private households.

²Estimate cannot be calculated.

Chart 1. Total employment in selected major economic sectors, 1959-84, and projected, 1985-95



omy, but because of saturation and the slowdown in new nonresidential construction, growth is expected to be slower than during the 1970's and early 1980's.

A component of business services that appears to be far from saturation is computer and data processing services. According to many industry experts, all signs point to continued explosive employment growth for this industry. At 8.4 percent a year, it is projected to be the fastest growing of all 378 3-digit³ industries in the economy.

Most of the growth within the computer and data processing industry will likely be in programming and software services. The investment boom in high technology products such as computer-assisted manufacturing and robotic production techniques projected to occur over the next decade will require significant increases in new software development, especially in high-level programming languages. Availability of new and cheaper computer hardware will also stimulate demand from small businesses and private consumers for new software, including "packaged" software. As a result, demand for programming services is projected to be very high through the next decade.

Employment in the data processing portion of the com-

puter services industry will also increase, but much less rapidly than jobs in programming and software services. Hardware developments have allowed more on-site processing, and repetitive data processing tasks generally require less highly specialized skills than programming and software services. These developments in new hardware and software now permit a firm's own nontechnical personnel to perform routine processing.

The temporary help industry is another business service with potential for rapid growth. Firms have become more successful in using temporary help to meet peak workloads and to weather business cycle swings without having to hire or fire permanent employees. Also, more workers may be willing to work as temporaries in coming years because of the opportunities for flexible scheduling and for part-time employment. Between 1978 and 1983, employment in temporary help agencies grew a rapid 6.6 percent a year, and in 1984 alone, the job level increased another third. The use of temporaries is expected to increase 5.0 percent a year between 1984 and 1995, faster than the 4.2-percent rate projected for business services as a whole.

The management and public relations industry is another

category that is projected to grow faster than the average for all business services. Included in this area are firms that manage all the business and financial operations for other organizations (such as doctors' offices). Also included are consulting services (except engineering, computer, or laboratory research), public relations services, lobbying, and sales promotion. Consulting services have been increasingly contracted for as rapidly changing technology requires the use of highly skilled specialists.

Professional services. A closely related area, the professional services industry, also ranks among the top six in terms of rate of employment growth and number of new jobs added between 1984 and 1995. (See table 3.) Included in this industry are legal services, engineering services, and accounting, auditing, and bookkeeping services. (See table 4.) Growth has occurred in this industry for many of the same reasons cited earlier for business services. Increased demand (such as from increased litigation), and contracting out for specialized professional services has led to 4.4-percent annual growth in employment and 4.9-percent increase in output over the 1959–84 period. Growth is projected to continue strong through the 1990's, averaging 3.5 percent for employment and 4.1 percent for output. More than 1 million new jobs are projected to be added by 1995, bringing employment in the professional services sector to 3.3 million.

Trade. The three trade industries fill out the list of the top four industries in terms of numbers of new jobs to be added between 1984 and 1995. Employment in wholesale and retail trade and in eating and drinking establishments is projected to grow by 4 million, to more than 28 million, by 1995. However, the rate of job growth, at 1.4 percent a year, is just slightly faster than that for the economy as a whole.

The real output of eating and drinking places rose rapidly over the past decade as more women entered the labor force and as the large population of young people boosted the popularity of fast-food establishments. Employment increases in eating and drinking places represented more than 10 percent of all jobs created in the economy between 1969 and 1979, and more than 16 percent of new jobs between 1979 and 1984. Demand for meals away from home is expected to taper in the next decade as the rate of growth of total disposable income slows, although there will still be opportunities for employment gains as an older population shifts its demand toward more labor-intensive "sit-down" restaurants. Employment in eating and drinking places is projected to rise by 1.2 million, to 6.9 million, by 1995, accounting for only about 7.6 percent of all new jobs.

Other retail establishments showing projected large job gains include grocery stores and department stores, with each group growing faster than total retail trade employment as a whole. Table 5 shows employment in some of the key

Table 3. Projected changes in employment¹ for selected industries, 1984–95

Most new jobs	Employment gain (in thousands)
Business services	2,633
Retail trade, except eating and drinking places	1,691
Eating and drinking places	1,203
Wholesale trade	1,088
Medical services, n.e.c.	1,065
Professional services, n.e.c.	1,040
New construction	558
Doctors' and dentists' services	540
Hotels and lodging places	385
Credit agencies and financial brokers	382
Fastest growing	Average annual rate of change (percent)
Medical services, n.e.c.	4.3
Business services	4.2
Computers and peripheral equipment	3.7
Materials handling equipment	3.7
Transportation services	3.5
Professional services, n.e.c.	3.5
Scientific and controlling instruments	2.9
Medical instruments and supplies	2.8
Doctors' and dentists' services	2.6
Plastics products	2.5
Most rapidly declining	Average annual rate of change (percent)
Cotton	-4.2
Wooden containers	-3.6
Leather products including footwear	-2.8
Iron and ferroalloy ores mining	-2.7
Sugar	-2.7
Leather tanning and finishing	-2.6
Railroad transportation	-2.6
Nonferrous metal ores mining, except copper	-2.6
Dairy products	-2.3
Blast furnaces and basic steel products	-2.2

¹Includes wage and salary jobs, the self-employed, and unpaid family workers.
n.e.c. = not elsewhere classified.

types of wholesale and retail establishments. Miscellaneous shopping goods stores (such as those selling jewelry, books, cameras, and sporting goods) are projected to grow quite a bit faster than the average for all retail stores. Gasoline service stations, on the other hand, are expected to have virtually no increase in jobs. Retail trade components projected to show absolute employment declines include variety stores, miscellaneous general merchandise stores, motorcycle dealers, fuel and ice dealers, household appliance stores, and furriers and fur shops. Many of the items formerly carried exclusively by these establishments now are being sold in department stores or in other types of retail stores.

Part of the anticipated rise in retail employment can be attributed to an increasing number of part-time jobs. In 1984, the workweek averaged 32.8 hours in retail stores and only 27.1 hours in eating and drinking places, compared to an average of more than 40 hours in manufacturing. The projections show the trend toward more part-time employment continuing: weekly hours in 1995 average 31.7 in retail trade stores and 26.2 in eating and drinking establishments.

In wholesale trade, which is projected to add more than

1 million jobs, a large part of the gain will be among machinery and equipment wholesalers. This reflects both the initial large size of this industry and increased sales of durable investment goods related to new capital spending. Other wholesalers projected to enjoy rapid employment growth are suppliers of sporting goods, paper and paper products, metals and minerals, and motor vehicles and auto equipment.

Health care. Medical care industries have been very important in contributing to employment growth in the past. Jobs in doctors' and dentists' offices rose by more than 1 million between 1959 and 1984. Hospitals added more than 2 million new jobs, while other medical services (such as nursing homes, outpatient facilities, and rehabilitation centers) increased employment by 1.5 million. In terms of rates of job growth, other medical services was first among the three health care industries, and, in fact, led all other industries in the economy between 1959 and 1984. While total private employment over this period was increasing at an annual pace of 1.7 percent, other medical services posted a 7.3-percent growth rate, hospitals, 4.6 percent, and doctors' and dentists' offices, 3.8 percent. Employment in all health care sectors combined accounted for almost 1 out of every 9 new jobs added to the economy between 1959 and 1984, and almost 1 out of every 5 over the 1979–84 period.

The value of output in health care has also risen dramatically. Despite price increases that have been much higher than the average for the economy as a whole, the real value of output of hospitals averaged a 6.4-percent annual gain for the 1959–84 period, compared to 3.0 for GNP. The real value of other medical services expanded by 6.6 percent a year, and output in doctors' and dentists' offices posted a 4.6-percent annual gain. By 1984, health care expenditures in real terms were about 6 percent of GNP (10 percent in current dollar terms).

In the last few years, however, new cost-containment measures, especially for hospitals, have altered this expansionary trend. The Federal Government has imposed strict limits on hospital reimbursements made under medicare, and private insurers are following the lead with other cost-saving restrictions. According to the American Hospital Association, the average length of stay in a community hospital dropped from 7.2 days in 1980 to a record low of 6.7 days in 1984. Hospital employment actually decreased in 1984, the only such occurrence since BLS estimates for the industry were first published in 1958.

Part of the cutback in hospital care is being taken up by doctors' offices and other medical facilities, such as nursing homes, emergency treatment centers, and home health services. This is possible, in part, because some procedures that used to require a hospital stay can now be performed in alternative settings. The shift has been encouraged by public and private health insurers because hospitals are generally more capital-intensive and have higher overhead costs

than some other types of health care establishments.

Cost-containment measures are expected to restrict the expansion of the health care industries over the next decade, despite increased demand generated by an aging population and by advances in medical technology. Hospital employment is projected to grow only 0.7 percent a year through 1995; doctors' and dentists' services, by 2.6 percent; and other medical services, by 4.3 percent. All rates are considerably slower than historical trends, although other medical services still ranks number one among all the industries in the economy in terms of projected growth. New health care jobs number 1.9 million over the next 11 years in the BLS projections, about 1 out of every 9 new jobs.

Outlook for other service-producing industries

Noncommercial sector. Another large employment industry is the noncommercial (or nonprofit) sector. Included in this industry are social services (such as nonprofit counseling centers, disaster relief, or the Salvation Army), community action agencies, fund-raising organizations, senior citizens' associations, museums, and membership organizations (such as labor unions or business, political, or religious groups). Employment in these noncommercial and membership organizations—2.2 million in 1984—is projected to grow to 2.5 million by 1995, or at a pace just about in line with the average for the economy as a whole.

Amusements. A field projected to grow almost twice as fast as the economy as a whole is amusement and recreation services. This industry is expected to continue to enjoy the effects of increased spending on leisure-time activities and the current popularity of health and fitness clubs. Personal consumption expenditures on amusement and recreation services are projected to grow by 4.5 percent a year between 1984 and 1995, compared to 2.8 percent for all consumer spending. Employment is projected to rise from 869,000 in 1984 to more than 1.1 million by 1995.

Financial services. The demand for banking and credit services is expected to be very high over the next 10 years. Deregulation in the industry, the projected capital spending boom, and the introduction of many new services will spur demand. It is also assumed that problems related to the recent uneven performance of several large U.S. banks due to heavy debt losses and to the uncertainty surrounding the huge loan balances of developing countries will be resolved. Industry losses in 1984 were linked primarily to those bank customers whose asset values fell because of the slower inflation rate, such as energy investors, real estate developers, home buyers, and farmers.

Despite high demand for financial services, employment in banking and credit agencies is projected to rise at a much slower pace than in the past. Jobs in banking and credit agencies combined expanded by more than 4 percent a year over the 1959–84 period, and for credit agencies alone, that

rate accelerated to 6.6 percent during the most recent 4-year span. Future job gains will be limited by consolidation of financial services and by advances in automatic banking. A total of 569,000 jobs are projected to be added in the two financial industries.

Employment in the insurance industry is also not expected to keep up with historical rates of growth. This industry, too, is becoming more concentrated and more automated. Functions once performed only by underwriters can now be computerized, cutting paperflow and allowing clerical personnel to prepare rate quotes. Industry job gains are projected to average 1.5 percent a year between 1984 and 1995, compared with 2.0 percent between 1959 and 1984.

Distribution services. Deregulation has also had, and will continue to have, a big impact in some of the transportation industries, in particular trucking and airlines. The output of the trucking industry is expected to grow along with the expanding economy. Employment will also increase in line with past trends, but more of it will consist of self-employed

Table 4. Employment growth in selected business and professional services, 1978-95

Industry	1984 employment (in thousands)	Average annual rate of growth		
		1978-83	1983-84	Projected, 1984-95
Total, all industries ¹	106,841	0.8	4.2	1.3
Business services ¹	4,612	7.1	13.5	4.2
Wage and salary jobs	4,059	6.2	13.5	4.3
Credit reporting and collection	80	- 8	6.0	1.6
Mailing, reproduction, and stenographic	166	6.9	13.4	4.1
Services to buildings	609	4.0	8.9	4.0
Personnel supply services	828	6.8	30.5	4.7
Employment agencies	160	6.2	22.2	3.8
Temporary help	631	6.6	33.7	5.0
Personnel supply, n.e.c.	37	12.2	17.8	4.3
Computer and data processing services	474	12.7	13.9	8.4
Programming and software	163	20.3	18.5	10.6
Data processing	232	7.8	8.4	5.5
Computer-related services, n.e.c.	78	20.3	22.3	10.6
Miscellaneous business services	1,728	5.4	11.3	3.3
Research and development labs	193	3.9	9.8	2.0
Management and public relations	458	8.0	13.6	4.8
Detective and protective services	394	5.0	8.8	2.8
Equipment rental and leasing	158	6.5	15.6	3.0
Photofinishing labs	78	3.8	9	1.5
Miscellaneous business services, n.e.c.	447	4.9	12.3	3.3
Professional services ¹	2,295	4.8	7.1	3.5
Wage and salary jobs	1,697	5.3	8.4	4.1
Legal services	650	7.1	7.9	4.4
Engineering and architectural services	635	3.8	10.4	3.8
Accounting, auditing, and bookkeeping	389	5.8	6.4	3.9

¹Includes wage and salary jobs, the self-employed, and unpaid family workers.

n.e.c. = not elsewhere classified.

SOURCE: Historical wage and salary data are based on BLS establishment survey; for industries for which establishment survey data were not published before 1982, the 1978-83 rates are based on unemployment insurance data.

Table 5. Employment in selected trade industries, 1979-95

(In thousands)

Industry	1979	1984	Projected, 1995	Increase, 1984-95
Total, all industries ¹	101,471	106,841	122,760	15,919
Wholesale trade ¹	5,501	5,897	6,985	1,088
Wage and salary jobs	1,204	5,550	6,578	1,028
Machinery, equipment, and supplies	1,261	1,393	1,803	410
Groceries and related products	648	710	806	96
Electrical goods	405	477	570	93
Motor vehicles and auto equipment	439	424	509	85
Retail trade except eating and drinking places ¹	11,953	12,660	14,351	1,691
Wage and salary jobs	10,517	11,236	12,890	1,654
Grocery stores	2,002	2,318	2,817	499
Department stores	1,878	1,925	2,366	441
New and used car dealers	881	844	904	60
Miscellaneous shopping goods stores	569	690	871	181
Gasoline service stations	577	581	582	1
Drug and proprietary stores	489	530	592	62
Eating and drinking places ¹	4,857	5,733	6,936	1,203

¹Includes wage and salary jobs, the self-employed, and unpaid family workers.

truckers rather than wage and salary workers. Air transportation employment is projected to have a much slower rate of growth than in the past, as a shakeout in the industry continues. On the other hand, the transportation services industry (mostly travel agencies) will be one of the top 10 employment growth sectors. The business of making travel arrangements is increasingly being shifted from the airlines to independent travel agents, in response to the complexity of the new rates and conditions of purchase arising from increased airline competition.

Communications services. Under the assumptions used in the BLS projections, the communications sector will enjoy the highest rates of growth in output of all the major sectors in the economy. (See table 2.) The demand for telecommunications services for data transmittal or other functions is expected to continue to show tremendous growth. The breakup of AT&T is also anticipated to lead to output growth by stimulating competition. The value of communications services is projected to expand by 6.2 percent a year, 1984-95.

As in past years, most of the increases in new telecommunications services will not require much additional employment. After remaining relatively constant at about 1 million to 1.2 million jobs for many years, employment in communications (except broadcasting) is projected to rise a bit to 1.3 million by 1995. Most of the increase will be limited to local cable television service operations, which are expected to grow as cable TV expands to new markets. The number of telephone workers is not projected to increase.

Manufacturing: strong demand but little job gain

As mentioned earlier, a capital spending boom, continued strong growth in real defense expenditures, and a rise in

exports of capital goods are expected to take place during the projection period, and this spending will provide a large boost to the manufacturing sector. Manufacturing output is projected to grow 3.0 percent a year from 1984 to 1995, compared to 2.9 percent for total GNP.

An investment boom is projected because of expected lower real interest rates; the prospect of a stable, noninflationary economy; and the desire on the part of manufacturers to take advantage of new technologies, purchases of which were postponed during the low-investment recession years 1980–82. Expenditures for producers' durable equipment under these assumptions are projected to rise much faster than total GNP through 1995—3.8 percent compared to 2.9 percent.

Augmenting the demand for capital investment goods will be greater expenditures for defense and for exports. Real defense purchases of goods and services are projected to show 5.3-percent annual growth between 1984 and 1990, and then taper off. This spending will have a large impact on the aircraft and guided missiles, ordnance, shipbuilding and repair, and communications equipment industries. Exports are also expected to increase much faster than GNP, and will be highly concentrated on high technology goods such as computers, electronic components, and communications equipment.

Somewhat offsetting this high demand for capital goods, however, is a parallel rise in imports. Durable goods imports have made sizable inroads in the domestic market in recent years, especially in electronic components, office equipment, machine tools, and other types of machinery and electrical equipment. The strength of the dollar against foreign currencies and slower economic growth in foreign markets made the United States an especially attractive magnet for imports in 1984, during which the Nation's merchandise trade deficit hit a record \$123 billion (in current dollars).

Market shares accounted for by imports are projected to continue to rise for almost all durable manufacturing industries, but overall demand for capital goods is expected to be high enough for domestic production to expand as well. The U.S. dollar is expected to weaken after 1985, tending to curb the import merchandise boom. Total imports in real terms are projected to grow 4.0 percent a year between 1984 and 1995, while exports are expected to enjoy a 5.6-percent yearly gain.

The increased investment in capital equipment leads to the projection of a reversal in a long-term trend for productivity. As has been well documented, growth in output per worker hour slowed dramatically in this country during the 1970's. From the 2.1-percent annual increase posted between 1968 and 1973, productivity gains fell to 0.8 percent a year from 1973 to 1979, and then to 0.5 percent a year between 1979 and 1982. Although many of the reasons for the slowdown are still unknown, several causes have been cited, such as the influx of new, inexperienced workers to the labor force; a slowing in capital accumulation per

worker; emphasis on nonproductive types of investment, such as for pollution control; and the oil price shocks, which diverted investment funds from production to energy conservation. Over the coming decade, many of these problems are expected to abate.

Productivity began a turnaround in 1983 and 1984 primarily as a result of the upswing in the business cycle, but this upturn is expected to be the start of a long-range advance in output per worker hour. Projections of large growth in investment expenditures on productive equipment, a more experienced labor force, and stable prices (including oil prices), contribute to the optimistic outlook for productivity. Gains are projected to average 1.7 percent annually through 1995.

Much of the productivity improvement will be centered in manufacturing. Manufacturing establishments are expected to take advantage of many new technologies as they expand facilities or replace aging capital stock. The new technologies include computer-assisted design, engineering, and manufacture; numeric control and computer-process control; industrial robots for many types of production operations, such as material handling, welding, spray painting, and parts assembly; lasers for printing, communications, metal fastening or cutting, and other functions; and numerous other changes specific to particular industries.⁴ Many of these new technologies are available now, but their use will be considerably more widespread in the next decade. The rate of technology diffusion within a particular manufacturing industry will depend on a number of factors: the size of firms, the industry concentration ratio, the cost structure of the industry, and the potential market for its product.

New technologies improve product quality and are often labor-saving, permitting output to grow without a corresponding increase in employment. Thus, while the value of output of the manufacturing sector is projected to grow by 3.0 percent a year from 1984 to 1995, employment is projected to rise only 0.6 percent annually. Because this rate of job increase is slower than that for the total economy, manufacturing employment is projected to decline as a proportion of all jobs from 18.5 percent in 1984 to 17.2 percent in 1995.

The decline in the manufacturing share of employment is most severe in nondurable goods industries, which for the most part do not supply any of the capital equipment or defense goods that will account for much of the growth in demand for manufacturing output. In fact, the projected slight drop in the all-manufacturing share of private GNP between 1984 and 1995 results from a decrease in the nondurable share. Nondurable goods are more heavily dependent on consumer purchases, which are expected to grow only modestly. Expenditures for food and clothing are expected to increase only in line with population growth, about 1.8 percent a year. Employment in nondurable manufacturing is actually projected to show an absolute decline, from 8.0 million jobs in 1984 to 7.9 million in 1995. Of

36 nondurable goods industries covered in these projections, 27 are projected to lose jobs.

Durable goods manufacturing industries have a somewhat better job outlook, with total employment rising from 11.7 million in 1984 to 13.2 million in 1995. Production of durable goods remains unchanged at 15.6 percent of private GNP over the projections period. Those durable goods industries that produce the new, advanced capital equipment expected to be in great demand will be especially favored, and several of the machinery, electrical equipment, and instruments industries are projected to show strong output and employment growth.

Computers and electronic components. Among the expanding durable goods industries, computer manufacturing ranks first. As in the last few decades, the domestic computer industry is projected to show phenomenal output gains despite rising competition from imports. This industry and the electronic components industry were the output growth leaders over the 1959–84 period, and their position will remain unchallenged through the projections span. In the BLS projections, computer production grows 8.4 percent a year, and electronic components, 7.5 percent, compared to only 2.9 percent annually for GNP. These rates of output growth occur despite rising competition from foreign manufacturers. Demand for these products is expected to be so high that it will absorb increases in both imports and domestic production.

Imports of computers are projected to grow almost 12 percent annually from 1984 to 1995, raising their share of total output (domestic production plus imports) from 15.5 percent to 20.4 percent. Foreign producers will also be competing with U.S. firms for overseas markets, but U.S. exports of computer equipment are still projected to rise by 10.5 percent a year, 1984–95. As a result, the industry will continue to have a positive net trade balance.

For electronic components, the picture is somewhat different in that imports are projected to exceed exports by 1995. Domestic production will remain strong, however, due to the increasing ubiquity of the computer chip, soon to be found in even the most mundane of machines and consumer products.

The computer and electronic components industries have typically enjoyed very high rates of productivity growth. Quality advances have occurred even as unit costs declined, and this trend is projected to hold through the nineties.

Employment is projected to expand from 479,000 in 1984 to 713,000 in 1995 in computer production and for electronic components, from 673,000 to 846,000. Thus, despite very rapid expansion of output, only 234,000 new jobs will be added in the manufacture of computer hardware and only 173,000 in electronic components manufacture; together, these increases are equivalent to less than two-thirds of the gains projected for computer and data processing services.

Communications equipment. Production of communications equipment is projected to get a big boost from several key demand areas. One is the market for telecommunications linkups to transmit computer data, which is far from sated. Another is defense expenditures, a large part of which go for communications equipment. The expansion of the cable television industry will also contribute to demand for communications equipment. In addition, export gains are expected as world demand for sophisticated U.S. equipment grows.

Output of telephone and telegraph apparatus (including cellular phones and carrier equipment) is projected to grow 6.0 percent a year between 1984 and 1995, and that of radio and communication equipment (such as broadcasting equipment, satellites, radar, traffic control systems, and sonar and laser systems), by 5.0 percent. Job gains will be considerably smaller owing to productivity growth, but at 2.0 percent and 2.3 percent, respectively, they are greater than the all-industries average of 1.3 percent and considerably above the 0.6 percent projected for manufacturing industries as a whole.

Autos. The introduction of new technologies is expected to have a significant impact in the auto industry. New plants are expected to incorporate the most up-to-date processing techniques available, turning out more cars with fewer workers. Plans have already been announced for several new operations, including GM's Saturn Project, which will rely heavily on computer-assisted design and manufacturing and on robotic production methods. Thus, while domestic output in the auto industry is expected to grow, employment in 1995 is projected to be lower than at present.

The industry was hit especially hard by the 1980 and 1981–82 recessions. As high interest rates, unemployment, and prices kept many buyers away from dealer showrooms, production fell an average of 13.8 percent annually between 1979 and 1982. Employment dropped 10.9 percent a year; from a high of 1 million jobs in 1978, the number of jobs fell by 300,000, to a 20-year low of 701,000 in 1982. In contrast, 184,000 jobs were cut back during the 1974–75 recession. The industry's recovery began in 1983 and picked up momentum in 1984. The 1984 value of production of cars, trucks, and vans was 50 percent higher than 1982's trough, and employment was back up to 863,000.

After recovery from the cyclical downturn, however, long-term secular trends are projected to dampen the industry's expansion. Demographic changes curbing the numbers of first-time buyers have reduced the potential market for new cars, and high sticker prices discourage frequent replacement. At the same time, the system of voluntary quotas on auto imports from Japan is being relaxed. These factors are projected to limit domestic output growth to 1.7 percent a year from 1984 to 1995, compared to prerecession gains in the 3- to 5-percent range. Imports, which represented 13.5 percent of the real value of total production in 1977, and

23.4 percent in 1984, are projected to account for 28.2 percent of the market by 1995. Given that all of the projected increases in domestic output will be accomplished with productivity gains, industry employment is projected to fall to 828,000 in 1995.

Machinery and other capital equipment. In the moderate-growth set of projections, many machinery and electrical equipment producers are expected to enjoy very healthy output gains over the next decade as a result of the investment boom. The material handling equipment industry, for example, is projected to experience output growth of 5.5 percent a year. This is the industry that supplies robotic handling equipment for moving goods within plants and factories, including hoists, cranes, and conveyors. Employment is projected to rise 3.7 percent a year, placing the industry among the top five fastest job gainers. (The level of employment remains very small, however. Total jobs are expected to rise from 80,000 to 119,000.)

Other durable goods industries expected to benefit from the investment and defense upswing include guided missiles and space vehicles, scientific and controlling instruments, medical and dental instruments and supplies, optical and ophthalmic equipment, electric transmission equipment, and miscellaneous electrical machinery (which includes electromedical equipment). All of these industries have projected output growth rates of over 4.0 percent, compared to 2.9 percent for the economy as a whole.

The high level of investment spending will also help several industries that are still struggling out of a recession slump. The industry manufacturing construction, mining, and oilfield machinery picked up production and jobs in 1984, but full recovery is not yet complete. Output and employment are projected to post 3.4-percent and 1.8-percent rates of gain through 1995, but the industry's 1995 employment level is still far short of the 1981 peak.

Another industry for which recovery has been slow is that producing farm and garden machinery. In recent years, low prices for farm commodities, changes in Federal support programs, and reduced foreign demand have seriously crimped the U.S. agricultural sector, forcing many farmers into foreclosures and bankruptcies. In the long run, however, recovery in the agricultural sector is anticipated, and the Nation's farm machinery producers should benefit from an improving world economy and from the favorable economic conditions projected to stimulate investment spending on all types of capital goods. Despite this projected upturn, though, both production and jobs in farm machinery are not expected to return to their prerecession levels by 1995.

Steel. The steel industry lost more than one-third of its jobs in the 1980-82 recessionary period, and regained virtually none of them in 1984. The decline in the steel industry actually began long before 1980. Because of such factors

as the strength of the dollar, large international wage differentials, and the lag in introducing new technologies such as continuous casting, domestic steel could not compete with cheaper-priced substitutes or foreign imports. The steady substitution of lighter-weight materials in transportation and other equipment accelerated as energy prices rose in the wake of the 1973-74 oil crisis. Even where steel continues to be used, it is often rolled thinner. By 1984, imports of steel had captured 18.7 percent of the total U.S. market, compared to 12.7 percent in 1977.

By 1995, imports are projected to represent 32 percent of the total value of steel used in this country. Domestic production is anticipated to be only a little above 1984's level. Whatever small gains are made in production will be achieved through rising productivity. In the BLS projections, steel employment drops from 335,000 in 1984 to only 261,000 in 1995.

Nondurable goods. As noted, many nondurable manufacturing industries are projected to lose jobs over the next decade. Limited demand growth coupled with improved production methods will contribute to this development.

Job losses occur in all of the 10 food processing industries included in the BLS projections. Employment is projected to decline from 1.6 million jobs in 1984 to fewer than 1.5 million in 1995. Some output gains will be registered, particularly for grain mill products, soft drinks, confectionery products, alcoholic beverages, and canned and frozen foods.

In apparel and other textile products, imports are expected to inhibit domestic production growth. Clothing imports are projected to rise to about 38 percent of the total market in 1995. The use of the computer in pattern grading and marker preparation, laser cutting of fabrics, and numerically controlled cutting and sewing machines are some of the new technologies projected to be more widespread in the 1990's. Employment in apparel manufacturing is projected to be 818,000 in 1995, compared to 1.023 million in 1984.

The chemical products industry is not expected to enjoy the rapid output growth characteristic of this industry during the sixties and early seventies. During that time span, production expanded in the 5- to 7-percent range, but after oil prices started to rise dramatically, the United States began to lose its competitive edge in producing chemicals. Annual output growth slowed to 2.8 percent between 1973 and 1979, and, as was the case for many other industries, production actually fell during the recession. Output picked up in 1984 and is projected to grow by 2.8 percent a year through 1995, but productivity gains will check increases in employment.

The only exceptions to the job-loss trend in nondurable industries will be printing and publishing, drugs, and miscellaneous plastics products. Projected job growth in these industries, however, represents a slowdown from past trends.

In printing and publishing, output growth offsets the mod-

est increases expected in productivity. Electronic composition, already prevalent in the production of big-city daily newspapers, is expected to become widely used by many smaller publications as well. Employment in newspapers, books, and other printing and publishing is projected to rise from 1.5 million in 1984 to 1.8 million by 1995, but the average rate of gain of 1.6 percent compares unfavorably to the 1.8 percent posted for 1959–84.

The drug industry is projected to show very rapid output growth—4.5 percent a year—between 1984 and 1995. A high rate of new product introductions and the growing number of elderly in the population will stimulate production. The industry has typically enjoyed strong productivity growth, however, and this is expected to continue. Employment increases are projected to average 1.6 percent a year through 1995, compared to 2.7 percent over the past 25 years.

In plastics products, historically a high-growth, low-productivity industry, output advances an average 4.3 percent a year and employment, 2.5 percent, over the projections period. Productivity improvements are limited in this industry due to the small size and specialized operations of its many firms and to the diversity of items produced.

High tech. High technology is often touted as the source of new employment opportunities to help replace jobs lost in declining “smokestack” industries. While faster-growing than the average for all sectors, and particularly the manufacturing sector, high tech industries are projected to account for only a small proportion of new jobs through 1995.

The Bureau’s definition of a high technology industry rests on the level of research and development expenditures, the ratio of scientific and technical personnel to total employment, and product sophistication. BLS developed three definitions of high tech, ranging from very broad to very narrow, in its first look at this subject.⁵ New employment projections for industries meeting the tests for the intermediate definition are shown in table 6.

Employment in these high technology industries accounted for 6.1 percent of all wage and salary jobs in 1972, 6.4 percent in 1984, and is projected to represent 7.0 percent by 1995. About 1.7 million, or almost 11 percent, of the 15.9 million total new jobs added between 1984 and 1995 will be in those high technology industries. As can be seen in table 6, 40 percent of the new high tech jobs will be in computer and data processing services.

Under the very broadest definition, which includes some mining, communications, trade, and professional services industries as well as additional manufacturing sectors, high tech will account for 14.6 percent of all jobs in 1995, an increase of 3.2 million from 1984’s level. Under the narrowest definition, which is limited to drugs, computers, communications equipment, electronic components, and aircraft and guided missiles, the high tech share in 1995

will be 3.2 percent, reflecting the addition of 0.7 million new jobs.

Government

Very little growth is expected in total government employment within the next 15 years. Most of the increased defense expenditures projected for the rest of this decade will be for materiel purchases and not for civilian personnel. Nondefense expenditures in real terms are projected to grow only very slowly, and employment is projected to remain at 1984’s level.

In State and local governments, a 1.2 million job gain is projected, bringing employment to 14.3 million in 1995. The projected upturn, which follows several years of employment cutbacks, primarily reflects an increase in the elementary school age population. Many more women have recently entered the prime childbearing ages, and while birth rates are not increasing, the total number of births is. This “echo effect” of the postwar baby boom is beginning to stimulate demand for elementary schoolteachers, most of whom are in the public sector. Employment in public education is projected to rise from 6.7 million in 1984 to 7.2 million in 1995, accounting for about 3 out of every 7 new jobs in State and local governments.

Table 6. Wage and salary employment in high technology industries,¹ 1972–95

[In thousands]

SIC ²	Industry	1972	1984	Projected, 1995
	Total nonfarm wage and salary	73,675	94,461	110,092
	High technology	4,469	6,024	7,730
	Percent of total	6.1	6.4	7.0
281	Industrial inorganic chemicals	141	143	152
282	Plastic materials and synthetics	229	177	161
283	Drugs	159	206	243
284	Cleaners and toilet preparations	122	145	160
285	Paints and allied products	69	62	57
286	Industrial organic chemicals	143	164	165
287	Agricultural chemicals	56	61	61
289	Miscellaneous chemical products	90	92	90
291	Petroleum refining	151	151	142
348	Ordnance and accessories	82	76	86
351	Engines and turbines	115	115	124
355	Special industry machinery	177	168	197
357	Office, computing, and accounting machines	260	526	756
361	Electric transmission equipment	128	116	131
362	Electrical industrial apparatus	209	206	241
365	Radio and television receiving equipment	140	91	85
366	Communication equipment	458	617	787
367	Electronic components and accessories	355	673	846
369	Miscellaneous electrical machinery and supplies	132	156	186
372	Aircraft and parts	495	596	670
376	Guided missiles and space vehicles	93	155	196
381	Engineering and laboratory instruments	65	80	92
382	Measuring and controlling instruments	160	250	310
383	Optical instruments and lenses	18	35	34
384	Medical and dental instruments and supplies	91	172	234
386	Photographic equipment and supplies	117	124	135
737	Computer and data processing services	107	474	1,149
7391	Research and development laboratories	111	193	240

¹See text footnote 6.

²Standard industrial classification as defined by the U.S. Office of Management and Budget through 1972.

Employment in private education, on the other hand, is not expected to rise until after 1995, when today's larger birth cohorts begin to reach college age. Most of private school employment is concentrated in colleges and universities. Because of the 1970's "baby bust," enrollment in these institutions in 1995 is projected to reach its lowest level since 1968.

It should be noted that the rise in public school employment reflects only enrollment gains and a slight improvement in teacher-student ratios. If many States approve new graduation requirements, longer schooldays or schoolyears, and more rigorous academic standards, additional staff may be needed.

Employment in public hospitals is projected to remain almost level over the next decade at 1.1 million, as hospital cost-containment programs and a shift to private hospitals limit job growth in this part of State and local government operations. Jobs in other functions of State and local governments such as police, firefighting, sanitation, welfare, and administration are expected to rise modestly from 5.4 million in 1984 to 6.1 million in 1995. Declines in Federal grants-in-aid to States and localities and fiscal conservatism in general will keep the rate of job growth much lower than in the sixties and seventies.

Construction

The construction industry is projected to benefit from the expected growth in capital investment, particularly after 1990. Nonresidential construction is projected to recover from the recent oversupply of commercial office buildings, and to grow as factory modernization accelerates. In the BLS projections, business expenditures on construction increase by 1.6 percent annually through 1990, and 2.6 percent a year, 1990-95.

Residential construction shows the opposite pattern. The growth rate projected for the years 1984-90 is 2.4 percent, but only 1.8 percent, 1990-95. The initial expansion results as interest rates drop slowly and the industry continues to recover from the slump in new residential construction during the 1980-82 recession years. After 1990, demographic effects such as a slowdown in the rate of new household formation and a drop in the population of potential first-time homeowners begin to slow the rate of new home construction again.

Productivity is projected to accelerate in the construction industry as the prefabrication of modular buildings and other new construction techniques become more widespread. Employment in construction is projected to rise from 5.9 million to over 6.6 million by 1995. The rate of job growth is somewhat slower than past trends.

Alternatives

Evaluations of previous BLS projections have shown that at the industry level, the employment estimates can vary from actual experience by as much as 17 percent.⁶ The

largest percentage errors tend to occur in the smallest industries, however. When the industry errors are weighted by employment, the average absolute error for each industry declines to about 8 to 12.5 percent. In addition, while actual growth rates for the 149 industries will vary widely, projected growth rates usually fall within a much narrower band. The very fastest rates of growth or the very fastest rates of decline are usually underestimated.

To help address the fact that 10- to 15-year projections obviously entail uncertainty, BLS prepares alternatives to its baseline, or moderate-growth, projection. The alternatives developed for this set of projections include a high-growth case (with a larger labor force, lower unemployment, and greater GNP), and a low-growth case (with the opposite characteristics).

Under low-growth assumptions, total employment only reaches 117.3 million by 1995, compared to 122.8 million in the baseline projection. Because the lower employment level is reflected across all industries, the distribution of employment among the major sectors remains about the same. The only difference in the distribution is that government accounts for a larger share, because Federal employment is assumed to be the same in all three scenarios and State and local government employment is only slightly lower than in the base case. (See table 1 for employment estimates for all three scenarios by major industrial sector, and table 7 for detailed industry projections.)

In the high-trend version, total employment stands at 127.7 million in 1995, 5 million more than the base case. Again, the distribution of employment among the major sectors resembles that of the baseline scenario.

Differences from previous projections

In 1983, BLS published its first estimates of economic growth and employment through 1995.⁷ The new projected employment level is lower than the previous projection for two main reasons: the new projection of the 1995 labor force is lower because of a slowdown in the rate of increase in women's labor force participation that started in 1978 and continued through 1984; and there was a downward revision in the exogenously determined adjustment factor which converts household employment (number of persons working) to establishment employment (number of jobs).⁸ At the industry level, the new output and employment trends differ from previous estimates in a variety of ways:

- The last projections for 1995 used 1982, a recession year, as the latest historical reference point. Many industries were expected to show high rates of growth primarily because of recovery from recession lows. Because this recovery has already occurred for many sectors, the projected growth rates for 1984-95 appear to be lower.
- Some industries have not fully recovered yet from their recession troughs but are still expected to do so. This may result in projections of unusually high rates of growth

Table 7. Employment¹ by industry, 1959-95

[In thousands]

Industry	Actual				Projected					
	1959	1969	1979	1984	1990			1995		
					Low	Moderate	High	Low	Moderate	High
Agriculture, forestry, and fisheries:										
Dairy and poultry products	1,479	754	449	374	318	324	327	297	305	310
Meat animals and livestock	933	701	527	472	439	448	452	398	404	415
Cotton	539	159	58	46	33	31	38	24	29	33
Food and feed grains	915	589	583	604	536	555	561	500	506	515
Agricultural products, n.e.c.	1,369	1,037	1,155	1,155	1,150	1,155	1,167	1,135	1,157	1,168
Forestry and fishery products	63	55	80	78	73	77	78	76	82	89
Agricultural services	285	327	488	564	575	574	578	540	576	598
Mining:										
Iron and ferroalloy ores mining	33	30	31	17	14	15	16	12	13	15
Copper ore mining	23	34	33	16	14	16	18	12	14	16
Nonferrous metal ores mining	31	25	38	24	21	22	24	16	18	19
Coal mining	201	138	261	198	191	199	203	181	185	189
Crude petroleum and natural gas	202	157	212	285	283	291	296	274	289	303
Stone and clay mining and quarrying	105	99	104	90	91	96	97	87	92	97
Chemical and fertilizer mineral mining	19	18	25	21	19	21	22	18	20	22
Construction:										
Maintenance and repair construction	870	868	1,339	1,246	1,275	1,332	1,358	1,373	1,404	1,430
New construction	3,040	3,506	4,540	4,674	4,635	4,857	4,918	4,957	5,232	5,427
Manufacturing:										
Durable goods:										
Ordnance	50	175	73	95	103	108	110	105	111	118
Guided missiles and space vehicles	94	107	81	120	143	149	151	143	152	158
Logging	149	137	149	125	107	111	114	100	107	114
Sawmills and planing mills	305	230	237	203	184	192	195	183	190	195
Millwork, plywood, and wood products, n.e.c.	264	310	393	360	366	380	385	363	381	394
Wooden containers	43	36	19	14	11	12	13	8	9	10
Household furniture	259	316	329	295	303	317	322	303	321	332
Furniture and fixtures, except household	126	153	176	211	241	247	254	249	262	275
Glass	153	188	202	169	167	171	175	164	173	179
Cement and concrete products	210	228	255	231	238	245	248	238	249	255
Structural clay products	78	64	52	38	32	35	36	26	30	33
Pottery and related products	49	45	52	45	44	47	48	46	47	50
Stone and other mineral products, n.e.c.	125	140	165	133	146	150	154	144	149	156
Blast furnaces and basic steel products	588	644	571	335	283	311	339	235	261	325
Iron and steel foundries and forgings	269	312	324	209	192	205	208	182	194	204
Primary copper and copper products	137	160	161	133	132	137	140	127	133	140
Primary aluminum and aluminum products	111	153	170	147	147	153	157	150	158	162
Primary nonferrous metals and products	78	93	93	77	71	75	76	66	70	74
Metal cans and containers	75	87	80	58	54	58	59	48	52	55
Heating equipment and plumbing fixtures	71	76	76	63	60	63	64	57	60	62
Fabricated structural metal products	345	440	535	448	479	496	507	501	525	542
Screw machine products	88	114	117	97	99	106	108	101	108	113
Metal stampings	189	255	245	211	219	229	231	224	232	240
Cutlery, handtools, and general hardware	135	165	185	148	155	161	163	156	164	169
Fabricated metal products, n.e.c.	232	315	376	344	372	387	393	381	402	423
Engines and turbines	90	112	145	116	115	121	123	117	124	130
Farm and garden machinery	128	141	184	111	125	131	135	129	136	145
Construction, mining, oilfield machinery	162	202	276	178	203	208	211	206	216	226
Materials handling equipment	65	95	106	80	99	104	105	113	119	123
Metalworking machinery	252	347	379	313	346	360	366	357	377	392
Special industry machinery	164	206	205	168	176	187	190	186	197	204
General industrial machinery	221	291	329	273	292	309	313	308	325	336
Nonelectrical machinery, n.e.c.	168	246	312	301	326	338	344	337	356	366
Computers and peripheral equipment	111	224	339	479	614	640	648	680	713	741
Typewriters and other office machines	28	52	59	48	46	50	50	41	44	47
Service industry machines	97	147	188	171	178	187	191	186	194	201
Electric transmission equipment	157	207	221	224	221	228	230	221	231	238
Electrical industrial apparatus	176	223	251	206	223	230	232	229	241	250
Household appliances	157	187	178	150	147	153	155	146	150	156
Electric lighting and wiring equipment	134	205	225	201	212	221	223	213	223	234
Radio and television receiving equipment	114	156	116	93	89	90	95	83	87	91
Telephone and telegraph apparatus	105	146	165	144	168	171	173	176	180	184
Radio and communication equipment	252	409	357	472	537	556	564	584	607	622
Electronic components and accessories	213	394	525	673	750	797	808	802	846	877
Electrical machinery and supplies, n.e.c.	112	125	176	163	181	183	189	186	194	205
Motor vehicles	696	912	991	863	820	852	863	795	828	861
Aircraft	722	805	632	634	666	692	710	680	714	737
Ship and boat building and repair	152	193	230	199	206	222	225	215	225	237
Railroad equipment	41	51	74	36	36	36	39	35	36	38
Motorcycles, bicycles, and parts	9	14	20	16	15	17	18	14	16	19

See footnotes at end of table.

Table 7. Continued—Employment¹ by industry, 1959–95

[In thousands]

Industry	Actual				Projected					
	1959	1969	1979	1984	1990			1995		
					Low	Moderate	High	Low	Moderate	High
Manufacturing—Continued										
Durable goods—Continued										
Transportation equipment, n.e.c.	23	89	103	86	98	102	105	99	106	114
Scientific and controlling instruments	166	195	215	222	263	268	274	287	304	315
Medical instruments and supplies	45	82	144	172	207	216	220	223	234	244
Optical and ophthalmic equipment	85	75	81	77	76	80	82	73	78	81
Photographic equipment and supplies	69	111	134	124	130	133	134	130	136	143
Watches and clocks	30	35	28	15	15	16	17	14	15	17
Jewelry and silverware	67	78	92	78	75	78	82	73	78	81
Musical instruments and sporting goods	116	149	145	141	136	143	144	136	143	149
Manufactured products, n.e.c.	232	233	244	208	208	211	215	195	203	210
Nondurable goods:										
Meat products	325	344	363	361	335	345	350	320	331	339
Dairy products	327	260	189	164	129	134	138	122	127	133
Canned and frozen foods	249	291	316	286	273	287	293	261	275	284
Grain mill products	140	137	147	130	128	132	135	124	128	135
Bakery products	314	286	238	218	191	197	200	182	188	194
Sugar	38	36	31	25	21	22	23	18	19	20
Confectionery products	79	87	80	77	67	71	73	61	66	71
Alcoholic beverages	107	97	86	72	61	63	65	51	58	64
Soft drinks and flavorings	111	142	153	144	134	139	141	127	134	154
Food products, n.e.c.	144	151	160	157	146	150	151	139	148	154
Tobacco manufacturing	95	83	70	65	59	61	61	54	56	58
Fabric, yarn, and thread mills	619	616	531	440	390	406	408	343	361	381
Floor covering mills	39	58	61	54	44	47	49	41	44	45
Textile mill products, n.e.c.	74	82	71	56	49	52	54	44	47	49
Hosiery and knit goods	221	251	227	206	179	185	186	160	169	177
Apparel	1,101	1,244	1,125	1,023	883	924	937	775	818	851
Fabricated textile products, n.e.c.	144	182	198	194	184	191	200	177	186	197
Paper products	415	483	494	486	465	486	492	455	480	498
Paperboard containers and boxes	175	231	214	196	179	190	192	173	184	190
Newspaper printing and publishing	329	376	432	463	497	512	522	526	548	565
Periodical and book printing and publishing	156	210	230	274	289	298	307	296	313	325
Printing and publishing, n.e.c.	450	549	639	725	792	826	839	856	890	925
Industrial chemicals	260	296	328	300	291	302	307	287	306	322
Agricultural chemicals	54	65	70	61	61	62	64	60	62	64
Chemical products, n.e.c.	82	124	99	99	95	102	104	96	102	105
Plastic materials and synthetic rubber	81	108	100	88	83	87	89	79	83	86
Synthetic fibers	79	132	112	88	75	82	89	74	79	82
Drugs	106	143	193	206	222	229	235	234	245	254
Cleaning and toilet preparations	89	123	140	145	149	154	156	154	160	166
Paints and allied products	62	72	69	62	57	60	61	54	58	60
Petroleum refining and related products	217	182	210	189	179	183	185	168	175	182
Tires and inner tubes	105	119	127	94	87	90	92	82	86	92
Rubber products except tires and tubes	178	162	167	148	140	145	148	126	132	137
Plastics products, n.e.c.	94	320	494	544	620	659	676	670	712	753
Leather tanning and finishing	36	29	20	17	13	15	15	11	13	13
Leather products including footwear	341	316	232	178	145	152	161	121	130	139
Transportation:										
Railroad transportation	930	651	559	378	314	323	325	272	283	298
Local transit and intercity buses	315	314	302	317	316	325	332	323	330	338
Truck transportation	1,019	1,212	1,551	1,560	1,673	1,750	1,783	1,766	1,868	1,950
Water transportation	239	234	222	206	207	218	222	220	230	239
Air transportation	185	357	443	498	516	538	545	556	579	607
Pipelines, except natural gas	24	18	20	19	19	20	21	20	20	22
Transportation services	71	111	198	262	318	333	339	362	382	399
Communications:										
Radio and television broadcasting	90	131	191	237	253	263	268	278	290	303
Communications, except radio and tv	749	919	1,121	1,116	1,176	1,222	1,243	1,228	1,295	1,353
Public utilities:										
Electric utilities, public and private	430	460	608	702	738	763	778	784	827	863
Gas utilities	215	220	220	223	218	227	233	214	226	235
Water and sanitary services	63	88	94	115	118	121	124	118	124	133
Trade:										
Wholesale trade	3,380	4,159	5,501	5,897	6,471	6,710	6,827	6,632	6,985	7,291
Eating and drinking places	2,002	2,806	4,857	5,733	6,190	6,470	6,597	6,625	6,936	7,250
Retail trade, except eating and drinking places	8,110	9,706	11,953	12,660	13,329	13,926	14,282	13,590	14,351	15,004
Finance, insurance, and real estate:										
Banking	644	987	1,498	1,678	1,706	1,780	1,857	1,777	1,865	1,946
Credit agencies and financial brokers	391	652	900	1,239	1,400	1,467	1,492	1,538	1,621	1,689
Insurance	1,150	1,368	1,748	1,904	2,075	2,150	2,173	2,112	2,237	2,335
Real estate	774	852	1,368	1,475	1,518	1,594	1,624	1,598	1,675	1,747

See footnotes at end of table.

Table 7. Continued—Employment¹ by industry, 1959–95

(In thousands)

Industry	Actual				Projected					
	1959	1969	1979	1984	1990			1995		
					Low	Moderate	High	Low	Moderate	High
Services:										
Hotels and lodging places	906	1,060	1,543	1,914	2,063	2,146	2,198	2,153	2,299	2,420
Personal and repair services	1,202	1,226	1,231	1,388	1,486	1,535	1,572	1,579	1,664	1,732
Beauty and barber shops	576	629	626	663	638	670	671	636	675	709
Business services	830	1,688	3,173	4,612	5,995	6,200	6,310	6,887	7,245	7,535
Advertising	123	134	165	213	246	250	253	260	267	277
Professional services, n.e.c.	785	1,041	1,804	2,295	2,702	2,823	2,876	3,170	3,335	3,483
Automobile repair and services	443	566	834	1,022	1,015	1,079	1,102	1,123	1,194	1,249
Motion pictures	232	247	309	328	346	358	366	377	390	408
Amusements and recreation services	378	496	768	869	1,003	1,045	1,066	1,084	1,135	1,181
Doctors' and dentists' services	642	801	1,346	1,650	1,902	1,949	1,989	2,120	2,190	2,284
Hospitals	975	1,776	2,614	3,001	3,093	3,242	3,300	3,071	3,256	3,400
Medical services, n.e.c.	313	671	1,432	1,821	2,347	2,449	2,495	2,725	2,886	3,023
Educational services	853	1,227	1,718	1,928	1,983	2,057	2,085	2,025	2,147	2,235
Noncommercial organizations	1,333	1,764	2,072	2,182	2,261	2,339	2,380	2,396	2,486	2,602
Household industry	2,279	1,856	1,326	1,242	1,106	1,148	1,174	982	1,023	1,060
Government enterprises:										
U.S. Postal Service	574	732	661	703	657	699	712	640	677	721
Federal enterprises, n.e.c.	104	152	155	123	129	134	136	133	140	145
Local government passenger transit	71	87	130	174	194	197	200	202	209	219
State and local enterprises, n.e.c.	225	351	541	485	493	513	525	509	536	568

¹Includes wage and salary jobs, the self-employed, and unpaid family workers.
n.e.c. = not elsewhere classified.

for some industries between 1984 and 1995. Examples are construction and mining machinery, farm machinery, and some of the mining industries.

- The composition of GNP in 1995 in the new projections is shifted more towards producers' durable equipment, exports and imports, and defense. Purchases of nondurable goods, on the other hand, are now projected to be lower.
- More investment in capital goods results in higher productivity in the new BLS projections, especially in manufacturing. Consequently, manufacturing employment in

1995 is lower than previously estimated. In the last projections, many manufacturing industries were not expected to regain historical peaks, and that is even more true in the new projections.

- The shift to service employment is even more pronounced in the new projections. Despite a lower total employment level in 1995, service sector employment is almost the same as in the previous set of projections. The service sector had been expected to account for 24.5 percent of total jobs in 1995; now, it is expected to hold a 25.4-percent share. □

—FOOTNOTES—

¹In developing projections, BLS procedures yield employment at two distinct levels of disaggregation. In the input-output model used, the economy is divided into 156 sectors, of which 149 have employment. As the projections proceed, a second level of disaggregation produces employment projections for 378 separate industries at the 3-digit SIC (Standard Industrial Classification) level, which match the industry detail in the industry-occupation matrix used in developing the projections of employment by occupation.

²As reported in personal interviews with industry executives conducted by BLS staff.

³See footnote 1.

⁴For descriptions of many of these new technologies, see the series of publications developed by the Bureau's Office of Productivity and Technology. The latest report, *The Impact of Technology on Labor in Four Industries*, Bulletin 2228 (Bureau of Labor Statistics, May 1985), contains a complete list of these studies.

⁵The BLS intermediate definition of high tech includes manufacturing industries having a ratio of R&D expenditures to net sales that is close to or above the average for all industries, and a ratio of technology-oriented workers to total employment equal to or greater than the average for all

manufacturing industries. Two nonmanufacturing industries—computer and data processing services and research and development laboratories—are included because their product is technical support for manufacturing industries.

The broadest definition of a high technology industry specifies only that the proportion of technology-oriented workers to total employment must be one and a half times the average for all industries. The narrowest definition requires the industry ratio of R&D expenditures to net sales to be twice the all-industry average.

For more information on high tech industries, see Richard W. Riche, Daniel E. Hecker, and John U. Burgan, "High-technology today and tomorrow: a small slice of the employment pie," *Monthly Labor Review*, November 1983, pp. 50–58.

⁶John H. Tschetter, "An evaluation of BLS's projections of 1980 industry employment," *Monthly Labor Review*, August 1984, pp. 12–22.

⁷See several articles in the *Monthly Labor Review*, November 1983, pp. 3–49; and *Employment Projections for 1995*, Bulletin 2197 (Bureau of Labor Statistics, March 1984).

⁸For a discussion of the differences between household and establishment employment, see the Explanatory Notes in any monthly issue of the BLS publication *Employment and Earnings*.