Industry output and employment: a slower trend for the nineties

Of the 18 million new jobs expected by 2000,
the service-producing sector will dominate,
with about half added to retail trade,
health services, and business services

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The U.S. economy is projected to add another 18 million jobs by the year 2000, an average of 1.5 million per year from 1988. This rate of growth is slower than in the past, when annual job gains averaged 2.3 million over a comparable 12-year period. Slower growth is directly tied to the expectation of less labor force expansion over the next decade.

The 18 million new jobs are expected to be added primarily in the service-producing sector. In contrast, manufacturing employment is projected to shrink slightly, from 19.4 million in 1988 to 19.1 million at the turn of the century. Among the service-sector leaders, retail trade is expected to add 3.8 million jobs; private health services, 3.0 million; and business services, 2.7 million. Government employment, especially in public schools and in State and local safety and general government functions, is also projected to add about 1.6 million new jobs. Despite these gains, the rate of growth for all these divisions from 1988 to 2000 is much slower than that between 1976 and 1988.

Total job growth averaged 2.3 percent a year from 1976 to 1988, but is only expected to average 1.2 percent annually through 2000. Job growth parallels the projected growth in the labor force. Details are in the article by Howard N Fullerton on pp. 3–12, but in broad terms, a slowdown in labor force growth projected for the nineties is a continuation of a trend that started in the late 1970's, as the baby-boom generation became fully absorbed into the labor force. Coupled with the smaller numbers of new, young workers during the next decade is the expectation of a slowdown in the rate of increase of female labor force participation.

Assumptions about the overall level of economic activity, which are also key factors underlying the industry output and employment projections, are in the article by Norman C. Saunders on pp. 13–24. Economic growth, as measured by real gross national product, is projected to average 2.3 percent a year between 1988 and 2000, and the unemployment rate is projected to be 5.5 percent. Strong gains are especially projected for exports, leading to strength in the manufacturing sector.

Three alternative scenarios were projected for 2000: a base, or moderate case; a low-growth alternative; and a high-growth alternative. The data discussed in this article pertain mainly to the moderate case scenario, with a section at the end describing the low and high projections.

Employment in major industries

Total employment is projected to rise from 118 million in 1988 to 136 million by the turn of the century. (See table 1.) Most of these jobs, 122

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million, will be wage and salary jobs in the nonfarm sector. Of the rest, 3 million are projected in agriculture (a slight decline from the 1988 level), and almost 10 million represent nonfarm self-employed and unpaid family workers. The number of self-employed is projected to grow at about the same pace as wage and salary employment—both substantially slower than in the previous 12 years. Service-producing industries are projected to rise to 79.0 percent of all nonfarm wage and salary jobs, compared with 75.9 percent in 1988. Goods-producing industries are expected to lose in em-

ployment share, as they have done for decades.

Among the major industry divisions, services will continue to dominate the job growth picture. Employment in the services division is projected to rise from 25.0 million in 1988 to 33.7 million in 2000. This increase accounts for almost one-half of all the new jobs added. The services division encompasses such diverse categories as health, business, personal, and recreational services, among others. Health and business services alone, the two largest, are projected to employ more than 18 million by the year 2000, an increase of almost one-third over

Table 1. Employment by major industry division, 1976, 1988, and projected to 2000

[Numbers in thousands]

Industry	1976	1988	2000			Change, 1988–2000		
			Low	Moderate	High	Low	Moderate	High
Total	89,942	118,104	127,118	136,211	144,146	9,014	18,107	26,042
Nonfarm wage and salary	79,080	104,960	114,154	122,056	128,998	9,194	17,096	24,038
Goods-producing	23,358	25,252	23,512	25,680	27,785	−1,740	428	2,533
Mining	779	721	656	705	827	−65	−16	106
Construction	3,576	5,125	5,504	5,885	6,318	379	760	1,193
Manufacturing	19,003	19,406	17,352	19,090	20,640	−2,054	−316	1,234
Durable	11,080	11,436	10,160	11,220	12,255	−1,276	−216	819
Nondurable	7,923	7,970	7,192	7,870	8,385	−778	−100	415
Service-producing	55,722	79,708	90,642	96,376	101,213	10,934	16,668	21,505
Transportation and utilities	4,583	5,548	5,713	6,096	6,587	165	548	1,039
Wholesale trade	4,546	6,029	6,463	6,936	7,457	434	907	1,428
Retail trade	13,208	19,110	21,251	22,875	23,812	2,141	3,765	4,702
Finance, insurance, and real estate	4,271	6,677	7,306	7,762	8,104	629	1,085	1,427
Services	14,243	24,971	31,644	33,718	35,258	6,673	8,747	10,287
Government	14,871	17,373	18,265	18,989	19,995	892	1,616	2,622
Agriculture	3,371	3,259	2,797	3,125	3,315	−462	−134	56
Private households	1,398	1,163	1,014	1,103	1,166	−149	−60	3
Nonfarm self-employed and unpaid family	6,093	8,722	9,153	9,927	10,667	431	1,205	1,945

Industry	Percent distribution of wage and salary employment					Annual rate of change			
	1976	1988	2000			1976–88	1988–2000		
			Low	Moderate	High		Low	Moderate	High
Total	—	—	—	—	—	2.3	.6	1.2	1.7
Nonfarm wage and salary	100.0	100.0	100.0	100.0	100.0	2.4	.7	1.3	1.7
Goods-producing	29.5	24.1	20.6	21.0	21.5	.7	−.6	.1	.8
Mining	1.0	.7	.6	.6	.6	−.6	−.8	−.2	1.1
Construction	4.5	4.9	4.8	4.8	4.9	3.0	.6	1.2	1.8
Manufacturing	24.0	18.5	15.2	15.6	16.0	.2	−.9	−.1	.5
Durable	14.0	10.9	8.9	9.2	9.5	.3	−1.0	−.2	.6
Nondurable	10.0	7.6	6.3	6.4	6.5	.0	−.9	−.1	.4
Service-producing	70.5	75.9	79.4	79.0	78.5	3.0	1.1	1.6	2.0
Transportation and utilities	5.8	5.3	5.0	5.0	5.1	1.6	.2	.8	1.4
Wholesale trade	5.7	5.7	5.7	5.7	5.8	2.4	.6	1.2	1.8
Retail trade	16.7	18.2	18.6	18.7	18.5	3.1	.9	1.5	1.9
Finance, insurance, and real estate	5.4	6.4	6.4	6.4	6.3	3.8	.8	1.3	1.6
Services	18.0	23.8	27.7	27.6	27.3	4.8	2.0	2.5	2.9
Government	18.8	16.6	16.0	15.6	15.5	1.3	.4	.7	1.2
Agriculture	—	—	—	—	—	−.3	−1.3	−.3	.1
Private households	—	—	—	—	—	−1.5	−1.1	−.4	.0
Nonfarm self-employed and unpaid family	—	—	—	—	—	3.0	.4	1.1	1.7

NOTE: Dash indicates data not available.

their current levels. The rate of growth for services, however, is much slower than it has been in the past. Job growth is projected to average 2.5 percent a year between 1988 and 2000, compared with 4.8 percent a year during the 1976–88 period.

Retail trade will be the second largest of the major divisions by 2000, surpassing manufacturing as a source of employment. Retail jobs are projected to increase by 3.8 million between 1988 and 2000, raising employment in this sector to 22.9 million. Again, the projected rate of 1.5 percent is much lower than the 3.1 percent experienced between 1976 and 1988.

Many jobs in retail trade are part time. Average weekly hours were 30.0 in retail trade in 1988, compared with 40.6 in manufacturing. A problem in finding workers willing to work part time exists in many local labor markets and may persist through part of the next decade, as the size of the youth labor pool shrinks and more and more women seek full-time careers. Consequently, the steady drop in the retail workweek, evident for decades, is projected to taper in the nineties.

The government division is projected to add 1.6 million jobs, virtually all at the State and local level. An increase in school enrollments over the next few years is expected to result in 945,000 new jobs in public education. Federal civilian employment has been virtually flat for the past 20 years at 2.7–3.0 million, and is projected to remain at about that level through the end of the century.

Other service-producing industries are projected to add 2.5 million jobs—1.1 million in finance, insurance, and real estate, 907,000 in wholesale trade, and 548,000 in transportation, communications, and public utilities. Like the other major divisions, the rate of job gain expected during 1988–2000 is only about half the pace of the previous 12 years.

Within the goods-producing sector of the economy, manufacturing jobs are projected to decline slightly, to 19.1 million in 2000. At the trough of the last recession in 1983, manufacturing jobs dropped to 18.4 million, and many feared the sector would never recover. Restructuring, plant closings, and layoffs dominated the news. Trade imbalances in 1984–86 exacerbated these problems and prevented manufacturing from bouncing back as the rest of the economy picked up steam. The value of the dollar began to fall from its unprecedented high, however, and by mid-1987 the trade balance improved. Both production and jobs in manufacturing industries began to expand, even in sectors previously identified as long-term losers. In 1988, manufacturing employment re-

covered to 19.4 million.

Despite this recent healthy growth, the factory job level is still below the 1979 peak of 21 million, and is not projected to climb much higher than current levels. Many of the closed plants were the older, inefficient ones, and while no additional massive closings are anticipated, it is unlikely that tomorrow's factories will employ as many workers as in the 1970's. Production, however, is projected to show very healthy growth during the 1988–2000 period, boosted by an export expansion of 4.7 percent a year. Real output of U.S. manufacturing is projected to grow 2.3 percent a year (2.9 percent for durable goods), in line with the economy as a whole. (See table 2.)

The modest decline projected in factory jobs masks a pronounced shift occurring in the occupational distribution of manufacturing employment to more highly-skilled jobs. While the total employment loss is projected at only 316,000, operator, fabricator, and laborer occupations are projected to lose 714,000 jobs and precision production workers (especially assemblers and inspectors), 137,000. Losses will also be registered for administrative support and service occupations. Partially offsetting these declines are gains in professional occupations (especially engineers), executive and management positions, marketing and sales, and technicians. (For more detail on occupational projections, see the companion article by George Silvestri and John Lukasiewicz on pp. 42–65.)

Among other goods-producing sectors, construction is projected to add 760,000 jobs between 1988 and 2000, to reach the 5.9-million level. Construction activity is expected to expand at a 2.1-percent annual pace, slower than the average rate between 1976 and 1988. Growth rates will vary significantly, however, for the different types of construction. The current slump in industrial building construction is expected to reverse during the nineties as growing manufacturing industries invest in the most up-to-date factory technologies. Present oversupplies of office and commercial space are expected to be absorbed by the early 1990's, and construction of these facilities will then experience an upturn. The slowdown in growth of the general population, as well as in the formation of new households, will limit residential construction, especially for single family homes.

Medical care

Health care will continue to be one of the most important industry sectors in the economy. Data from the Health Care Financing Administration show that total expenditures for health care

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(both public and private) topped 11 percent of current-dollar gross national product in 1987, and may rise to 15 percent by the end of the century.[1] The more narrowly defined BLS projections show that output of private health care services (in constant-dollar terms) rose from 3.3 percent of gross duplicated output in 1977 to 3.7 percent in 1988, and will grow to 4.2 percent by 2000.[2] Under either measure, health care is a significant and growing portion of the U.S. economy.

In job terms, this significance is amplified. Employment in the private health services industries rose from 4.4 million in 1976 (or 1 of every 18 wage and salary jobs) to 7.1 million in 1988 (1 of every 15), and is projected to grow to 10.1 million by 2000 (representing 1 of 12 jobs). The increase in health care jobs between 1988 and 2000 accounts for more than one-sixth of the total payroll job growth projected.

One of the most significant differences between the shares of output developed by the Health Care Financing Administration and those used by BLS in this analysis is that the former are in current dollars while the latter are adjusted for price increases. Medical care prices have consistently risen faster than the average for all goods and services, and this has been a major factor leading to recent cost containment efforts. Over the 1965–80 period, the Consumer Price Index rose 6.6 percent a year for all items, but 8.3 percent for medical services.

Because of burgeoning costs, government and private health insurance programs instituted

a series of measures in the early 1980's to try to hold down outlays. The medicare prospective payment system limiting government reimbursement of hospital procedures, as well as restrictions by private health insurers, forced a slowdown in health care price increases and also led to a major transformation of the health care industry. Procedures formerly conducted on an inpatient-basis in higher cost facilities such as hospitals shifted to lower cost centers such as outpatient facilities and clinics. Hospital utilization dropped sharply, as measured by admissions and inpatient days. The average patient stay declined from 7.1 days in 1982 to 6.4 days by 1987.[3] Releasing patients earlier led to a surge in demand for nursing home and home health care. In addition, diagnostic testing previously done in hospitals became more frequently performed at a lower cost by independent labs which can test large batches of specimens. Consumers have turned to health maintenance organizations (HMO's) in record numbers to hold down their own medical insurance costs. From 1982 to 1988, enrollments in HMO's increased from 10.8 million to 29.3 million.[4]

The output and employment data on the individual health care industries clearly illustrate this dramatic shift. Output (in constant 1982 dollars) rose almost three times faster in outpatient facilities (that is, HMO's and group health associations, diagnostic testing services, home health agencies, visiting nurses associations, and other related medical services) than in hos-

Table 2. Output by major industry division (gross duplicated output), 1976, 1988, and projected to 2000

[Billions of 1982 dollars]

Industry	1976	1988	2000			Percent distribution					Annual rate of change			
			Low	Moderate	High	1976	1988	2000			1976–88	1988–2000		
								Low	Moderate	High		Low	Moderate	High
Total	$5,319.6	$7,290.1	$8,702.1	$9,531.7	$10,671.6	100.0	100.0	100.0	100.0	100.0	2.7	1.5	2.3	3.2
Goods-producing	2,468.7	3,168.4	3,705.7	4,099.2	4,702.5	46.4	43.5	42.6	43.0	44.1	2.1	1.3	2.2	3.3
Mining	223.3	220.9	211.6	238.0	273.5	4.2	3.0	2.4	2.5	2.6	-.1	-.4	.6	1.8
Construction	355.6	482.9	568.5	622.1	692.5	6.7	6.6	6.5	6.5	6.5	2.6	1.4	2.1	3.0
Manufacturing	1,889.8	2,464.6	2,925.6	3,239.1	3,736.5	35.5	33.8	33.6	34.0	35.0	2.2	1.4	2.3	3.5
Durable	945.3	1,286.8	1,617.4	1,803.2	2,152.9	17.8	17.7	18.6	18.9	20.2	2.6	1.9	2.9	4.4
Nondurable	944.5	1,177.8	1,308.2	1,435.9	1,583.6	17.8	16.2	15.0	15.1	14.8	1.9	.9	1.7	2.5
Service-producing	2,676.1	3,932.4	4,781.7	5,197.1	5,711.7	50.3	53.9	54.9	54.5	53.5	3.3	1.6	2.4	3.2
Transportation and utilities	470.1	607.7	738.1	803.7	907.0	8.8	8.3	8.5	8.4	8.5	2.2	1.6	2.4	3.4
Wholesale trade	263.4	415.6	530.4	582.6	671.4	5.0	5.7	6.1	6.1	6.3	3.9	2.1	2.9	4.1
Retail trade	363.4	552.6	646.8	712.9	770.2	6.8	7.6	7.4	7.5	7.2	3.6	1.3	2.1	2.8
Finance, insurance, and real estate	591.0	861.8	1,057.1	1,137.2	1,229.7	11.1	11.8	12.1	11.9	11.5	3.2	1.7	2.3	3.0
Services	609.6	1,035.0	1,320.0	1,440.5	1,571.1	11.5	14.2	15.2	15.1	14.7	4.5	2.0	2.8	3.5
Government	378.6	459.7	489.3	520.2	562.3	7.1	6.3	5.6	5.5	5.3	1.6	.5	1.0	1.7
Agriculture	166.4	180.2	205.5	225.4	246.8	3.1	2.5	2.4	2.4	2.3	.7	1.1	1.9	2.7
Private households	8.4	9.1	9.2	10.0	10.6	.4	.3	.2	.2	.2	.7	.1	.8	1.3

pitals. Following are output and employment indexes of the detailed health care industries:

	Index (1982 = 100)		
	1984	1986	1988
Output:			
Offices of health practitioners	107.1	113.9	122.4
Nursing and personal care facilities	106.3	120.6	128.1
Hospitals	104.1	110.6	121.3
Outpatient and related	121.1	149.4	161.6
Employment:			
Offices of health practitioners	111.2	122.3	136.3
Nursing and personal care facilities	107.6	116.9	123.6
Hospitals	99.6	100.8	109.5
Outpatient and related	123.6	158.7	181.0

In employment terms, the shift toward outpatient services has been even more pronounced. Jobs in private hospitals rose about 10 percent between 1982 and 1988; in doctors' offices, 36 percent; and in outpatient facilities, 81 percent. Despite the much slower rate of growth, however, hospitals remain the largest employer among the medical services industries, with 3.3 million workers.

The 10-percent increase in hospital employment between 1982 and 1988 all occurred only within the last 2 years. After 7 years of virtually no growth, more than 150,000 jobs were added to private hospitals in 1988 alone. This indicates that the pressures of rising demand for hospital services may eventually have to be accommodated. Demand pressures stem from several factors, some of which are expected to intensify in the future: new medical technologies, a rapidly growing aged population, and treatment of AIDS patients.

New technologies are the most important factor in boosting the demand for health services. Because of advances, patients are likely to undergo more tests and diagnostic procedures, take more drugs, see more specialists, and be subjected to more aggressive treatments than before. Medical intervention will be possible for conditions previously undiagnosed or regarded as untreatable. The use of sophisticated and expensive new equipment, labor-intensive acute care, and multiple doctors' visits and lab tests is bound to accelerate.

Persons over age 75 are significantly higher users of hospital services than those under 75; they are hospitalized more frequently and stay longer. In addition, the rapidly growing population age 85 and older uses twice as many hospital days per capita than do persons ages 65 to

74.[5] One reason for this is the presence of multiple health problems in the very old, which causes much longer hospital stays. The 75-to-84 age group will expand in numbers from 9.5 million in 1988 to 12.0 million in 2000. The number of persons age 85 and older will increase from 3.0 million to more than 4.6 million. Both of these groups are growing much faster than the total population.[6]

The ability or willingness of the economy to pay for the new technologies and for the care of the aged clearly leads to uncertainty about the future level of medical services. In the moderate case scenario, hospital output is projected to grow an average of 3.3 percent per year between 1988 and 2000 and employment, 2.1 percent, the slowest growth of the four private medical services industries. (See table 3.) The fastest growing medical care sector will be outpatient facilities and related health services. The projection for this industry is 4.6 percent annual growth in real output and 4.7 percent in jobs, ranking this industry fifth in output growth and second in employment growth among all the 226 industries used by BLS in projecting output and employment. (See table 4.) Offices of health practitioners are projected to add jobs at a 3.5-percent yearly rate, and nursing homes and personal care facilities at a 3.1-percent pace. These employment growth rates for medical service industries, while higher than for most other industries, are below historical trends because of continued cost-cutting pressures.

In terms of absolute levels, more jobs will be added in the offices of health practitioners than in hospitals, despite the relatively larger size of hospital employment. Together, the four private

Table 3. Profile of private health industries, 1988–2000
[Levels in thousands]

Industry	Employment			Annual rate of change	
	1988	2000	Gain, 1988–2000	Employment	Output
Total health services	7,144	10,139	2,995	3.0	3.3
Offices of health practitioners	1,850	2,810	960	3.5	2.7
Offices of physicians	1,146	1,843	697	4.1	—
Offices of dentists	486	575	89	1.0	—
Other	218	391	173	5.0	—
Nursing and personal care facilities	1,319	1,907	588	3.1	3.9
Hospitals	3,300	4,245	945	2.1	3.3
Outpatient facilities and other health services	675	1,177	502	4.7	4.6
Medical and dental labs	149	239	90	4.0	—
Outpatient care facilities	266	475	209	4.9	—
Other	260	463	203	4.9	—

NOTE: Dash indicates data not available.

health service industries are projected to add 3 million new jobs.

Because of the rapid expansion of health care employment compared to other industrial sectors, 7 of the 10 fastest growing occupations between 1988 and 2000 are health-related. Medical assistants, home health aides, radiologic technologists and technicians, medical records technicians, medical secretaries, physical therapists, and surgical technologists rank among the top 10 fastest growing of 500 or so occupations studied.

Business services

Despite recent healthy growth, the factory job level is still below the 1979 peak of 21 million, and is not projected to climb much higher than current levels.

Business services come close to health care as a source for a large number of new jobs over the next 12 years. Employment in business services is projected to rise from 5.6 million in 1988 to 8.3 million by the end of the century. The 2.7-million increase represents almost 1 of every 6 new wage and salary jobs added between 1988 and 2000.

Business services is broken down into nine industries in the economic growth system. (See table 5.) The largest of these and the one projected to add the most new jobs over the next decade is personnel supply service, which includes the fast-growing temporary help supply industry. Temporary help supply has risen dramatically in the last few years. From 1978, when data were first available, to 1988, employment multiplied almost threefold, rising from 341,000 to 1,016,000. At this 11.5-percent per year rate, the temporary help supply industry has been one of the fastest-growing industries in the whole economy. Employers find temporary help advantageous because of the ease and convenience of meeting peak workloads or covering for absent permanent employees. Also, because temporary help supply agencies typically provide fewer fringe benefits, their rates frequently are competitive with the cost of directly hiring additional employees. Workers are attracted to these agencies because of the training opportunities and the flexible scheduling offered; some, however, may find it the only employment available.

Future gains in temporary help are expected to be slower than the rapid growth in the past few years, as the industry matures and stabilizes. For personnel supply services as a whole, of which four-fifths was temporary help in 1988, the rate of job growth is projected to average 4.1 percent through the nineties. Industry experts expect the skill level of temporary help workers to shift, with a slight increase in the proportion of computer programmers, accountants, engineers, and computer-skilled clerical

workers, and a slight decline in the proportion of laborers and clerical jobs that are not computer-related.

The fastest growing of the business service industries, indeed, the fastest in the whole economy, will be computer services. Employment in this industry sector is projected to grow by 4.9 percent a year, rising to 1.2 million by 2000. Demand for operations research analysts, computer systems analysts, programmers, and related computer specialists will continue to be very high through the turn of the century. Packaged software products as well as customized computer systems will continue to multiply. An ever-expanding number of industries, firms, government agencies, and private individuals are expected to propel the demand for computer and data processing services.

Another large business service industry, although one not growing as rapidly as personnel or computer services, is the research, management, and consulting sector. Employment in this industry is also expected to approach 1.2 million by the year 2000, averaging 3.2 percent yearly growth. Included in this industry are commercial physical and biological research and testing labs, market research, management services and consultants (providing activities such as operations research, human resources planning, financial planning and budgeting, and others), and public relations services. These types of services are being purchased by more and more private firms and by government.

The remainder of the business services industries will have somewhat slower growth than the three just described, although all are well above the growth rate projected for total employment. The sector which includes business services not elsewhere classified is expected to post 3.1 percent annual growth, adding 340,000 jobs. A large variety of activities is included in this sector, such as check validating, interior decorating, paralegal services, salvaging, speakers' and lecture bureaus, telemarketing, and many newly developing business services. Services to buildings, which include primarily janitorial services, is projected to add 243,000 jobs. Detective and protective services employment is expected to expand by 168,000. Most of this growth will be for building guards.

Education

Almost 1.2 million jobs will be added to education over the next decade. Most of the new jobs will be in the public sector, reflecting rising enrollment projected for elementary and secondary schools.

School enrollment below the college level

mirrors population growth, and, as can be seen in the following tabulation, the elementary school population (ages 5-13) will rise by more than 2 million between 1988 and 2000 (almost all of that in the 10–13 age group), and the secondary school population (ages 14–17), by about 1.3 million:[7]

Population (millions)

	Under age 5	Ages 5–9	Ages 10–13	Ages 14–17	Ages 18–24
1975	16.1	17.6	16.3	17.1	27.7
1980	16.5	16.6	14.5	16.1	30.4
1985	18.0	16.8	13.3	14.9	28.7
1988	18.3	18.0	13.4	14.0	26.9
2000	16.9	18.1	15.4	15.3	25.2

Employment in State and local government education was fairly level in the late 1970's and early 1980's as the number of school-age children dipped. By 1983, however, the youngsters born to the large baby-boom cohort started kindergarten and began to put upward pressure on public school facilities. Employment began to edge up, and reached an all-time high of 7.3 million in 1988. As these children advance through intermediate and secondary schools, employment in State and local government education is expected to climb to 8.3 million by the year 2000.

Private school enrollment is not as directly linked to population as is public school enrollment. About three-fifths of the employment in private education is in colleges and universities, and factors other than population are important determinants of enrollment in these institutions. The traditional college-age population (18–24) has been declining since 1981, but enrollment has moved generally in an upward direction nevertheless. Rising enrollment rates for older students, women, foreign students, and part-time students have offset the absolute decline in the 18- to 24-year-old population.

Employment in private colleges and universities has been rising even faster than enrollments, with more than 200,000 jobs added between 1983 and 1988 to reach 964,000. Part of the explanation for this large employment increase has been a rise in the proportion of part-time instructors in institutions of higher education.[8] Employment in all of private education, which includes private elementary and secondary schools, vocational schools, and miscellaneous training programs as well as colleges and universities, is projected to go up another 223,000 by the year 2000.

Not all the increase in public and private education will be for teachers. Increases are also expected for teacher aides, counselors, technicians, and administrative staff.

Related to the educational sector is the private child-care industry. The rapid growth of this sector in the 1980's has been linked to the rising labor force participation rates of mothers with young children and to the large increase in the absolute number of children under age 5. (See previous text tabulation.) Future growth is projected to be slower due to the expected 1.4 million decline in the under age 5 population over the next 12 years. Also, even though there will be a continued rise in labor force participation

Table 4. **Employment change in selected industries, 1988–2000**

[Levels in thousands]

Industry[1]	1988 level	Annual rate of change, 1988–2000
Fastest growing:		
Computer and data processing services	678	4.9
Outpatient facilities and health services, n.e.c.	675	4.7
Personnel supply services	1,369	4.1
Water and sanitation including combined services	152	3.9
Residential care	391	3.8
Offices of health practitioners	1,850	3.5
Arrangement of passenger transportation	175	3.4
Research, management, and consulting services	811	3.2
Individual and miscellaneous social services	571	3.2
Personal services, n.e.c.	294	3.2
Nursing and personal care facilities	1,319	3.1
Credit reporting and business services, n.e.c.	776	3.1
Miscellaneous publishing	79	3.1
Security and commodity brokers and exchanges	449	3.0
Advertising	237	2.8
Legal services	852	2.8
Automotive rentals, without drivers	164	2.7
Accounting, auditing, and services, n.e.c.	530	2.7
Miscellaneous transportation services	141	2.7
Detective and protective services	464	2.6
Most rapidly declining:		
Tobacco manufactures	56	-2.8
Telephone and telegraph apparatus	111	-2.3
Miscellaneous textile goods	56	-2.3
Alcoholic beverages	72	-2.2
Office and accounting machines	56	-2.2
Footwear, except rubber and plastic	90	-2.1
Railroad transportation	299	-2.1
Tires and inner tubes	84	-2.0
Photographic equipment and supplies	112	-1.8
Coal mining	151	-1.8
Luggage, handbags, and leather products, n.e.c.	54	-1.8
Miscellaneous transportation equipment	62	-1.7
Engines and turbines	94	-1.6
Electronic home entertainment equipment	85	-1.6
Sugar and confectionery products	98	-1.6
Apparel	893	-1.6
Knitting mills	211	-1.5
Sawmills and planing mills	206	-1.5
Automotive stampings	102	-1.5
Metal cans and shipping containers	53	-1.5

[1] Ranking is based on industries with employment levels of more than 50,000 in 1988.

n.e.c. = not elsewhere classified.

rates among young women 16–34, the rise will be much slower than in the past 12 years, except for the 30- to 34-year-olds. A factor supporting employment growth in the child day-care industry is the trend for private companies and government agencies to set up day-care facilities at the workplace. These employer-supported facilities, run under contract with independent day-care providers, should encourage a continued shift from care in the home and day care by relatives to use of child-care centers.

Retail trade

Retail trade is projected to add 3.8 million new jobs between 1988 and 2000, second only to services among all the major industry divisions. The number of retail trade jobs is expected to reach almost 23 million by 2000, accounting for almost 1 of every 5 wage and salary jobs in the economy. Further, many self-employed workers are found in the retail trade sector as well, adding 1.9 million to the total in that sector in 2000.

Eating and drinking places make up the largest industry within the retail trade division, and one of the fastest growing. Payroll employment is projected to rise 1.8 percent a year in eating and drinking places to 7.8 million by 2000. This rate of growth, however, is slower than historical increases in such jobs for several reasons. The major reason is the slower growing population, limiting the demand for new restaurants. Another reason is that the market may be reaching saturation, especially the fast-food market. Finally, part of the historical employment growth was related to an increasing proportion of part-time workers, a trend which is to taper.

Evidence already indicates that the shift to part-timers may be slowing, in that average weekly hours in eating and drinking places are not falling as rapidly in recent years as they have for the past three decades. This trend holds for other retail trade establishments as well. Retail trade accounts for about two-thirds of all the part-time workers in the economy, and part-time workers are predominantly women (two-thirds), and have a higher proportion of young workers ages 16–24 (one-third) than the full-time work force. The source of potential part-time workers has been diminishing as the youth labor force has declined in absolute numbers and fewer women seek part-time jobs. Eating and drinking places and other retail trade industries may have to offer higher compensation or greater benefits to entice full-time jobseekers, at least in the short run. The decline in the youth labor force is expected to reach its trough in 1996, then begin to increase again as the large number of children of baby-boom parents reaches working age.

There has been some attempt by eating and drinking places to fill their part-time job openings with older workers, but the data do not show that this has been successful. Demographic data from the Current Population Survey are not available at the detailed industry level, but data are available for detailed occupations. If we consider employment in food service occupations, more than two-thirds of which is concentrated in eating and drinking places, we can draw some inferences about the age distribution of the industry. Following are employment levels and percentages in food service occupations by age group, 1983–88:

	16–19	20–24	25–34	35–54	55–65	65 +
1983:						
Level (thousands)	1,248	1,107	977	1,080	347	101
Percent of total	25.7	22.8	20.1	22.2	7.1	2.1
1988:						
Level (thousands)	1,293	1,030	1,239	1,175	356	89
Percent of total	25.0	19.9	23.9	22.7	6.9	1.7

As the tabulation shows, the age composition of food service workers is shifting slightly away from teenagers and young workers, but not to those over 55. Rather, the 25-34 age group now accounts for an increased proportion. While the number of older workers in the labor force will rise substantially through the nineties (by 2.3 million), these workers are reluctant to accept low-skilled, low-paid jobs that typically provide few fringe benefits.[9]

Projections of employment for other retail trade industries indicate that grocery stores will gain 555,000 new jobs by 2000. Grocery stores

Table 5. Profile of business services industries, 1988–2000

[Levels in thousands]

Industry	Employment			Annual rate of change	
	1988	2000	Gain, 1988–2000	Employment	Output
Total business services	5,570	8,311	2,741	3.4	3.5
Advertising	237	330	93	2.8	4.4
Services to dwellings	785	1,028	243	2.3	3.3
Personnel supply	1,369	2,218	849	4.1	3.6
Computer	678	1,200	522	4.9	4.3
Research, management, consulting	811	1,190	379	3.2	3.3
Detective and protective	464	632	168	2.6	2.1
Equipment rental	262	356	94	2.6	2.1
Photographic	188	241	53	2.1	3.5
Credit and all other	776	1,116	340	3.1	3.2

are adding more labor-intensive services such as prepared meals in response to consumer demand for convenience. They are also staying open longer in areas where restrictions on hours of operation are being lifted. Department stores are projected to add 305,000 jobs, which represents only a 1.2-percent rate of growth, and miscellaneous shopping goods stores are projected to gain 269,000 jobs.

Other service-producing industries

As noted earlier, the finance, insurance, and real estate sector is projected to add almost 1.1 million payroll jobs between 1988 and 2000, bringing employment in that sector to 7.8 million by the turn of the century. The fastest growing industry within the financial sector is expected to be security and commodity brokers and exchanges, but the 3.0-percent annual employment growth rate projected is sharply lower than the rate in recent years in this industry, when employment expanded about 10 percent a year.

Employment in the communications industry division is projected to remain almost flat at about 1.3 million through the next decade. Output will show healthy growth, but new technology will result in very little job gains.

Among the transportation sectors, especially strong growth is projected for air transportation and the related industry arrangement of passenger transportation (travel agents). Despite safety concerns and near-capacity airports, demand for air travel is projected to grow rapidly. Job gains are projected to average 2.1 percent a year from 1988 to 2000, and output, 3.8 percent.

Within the services division, mention has already been made of health care, business services, education, and child day care. Other industries in the services division expected to show sizable employment increases include hotels (410,000 more jobs), legal services (329,000), residential care (224,000), engineering and architectural services (222,000), amusements and recreation (202,000), and accounting services (200,000).

Manufacturing and foreign trade

Led by expectations of high growth in U.S. exports, the manufacturing division is projected to enjoy a 2.3-percent per year expansion in real output, and a modest employment decline of 0.1 percent a year.

These generally optimistic projections come in the wake of the strong recovery in manufacturing in 1987 and 1988. Until then, despite several years of recovery from the deep recessions of 1980–82, many U.S. manufacturing industries were still languishing. The decline of inflation, but continued high real interest rates, caused investment to shift from real assets such as factories and producers' equipment towards financial assets. It also caused the U.S. dollar to rise to extraordinary levels compared to foreign currencies, closing many overseas markets to U.S. exports but making imports relatively cheap. Particularly hard hit by disinflation and an overvalued dollar were the sectors related to commodities—farming, mining, and manufacturing, especially heavy goods manufacturing.

By mid-1987, a correction in the foreign exchange markets began to have an impact. As the value of the dollar fell and foreign economies experienced fairly strong growth, U.S. manufacturers were able to recover many overseas markets lost during the 1984–86 period. Export growth far surpassed most other final demand categories, and imports slowed their rate of gain as the falling dollar made import prices swing up. Some of the manufacturing sectors which showed the greatest gains in their export markets during this rebound were selected machinery industries, aircraft and missile engines and equipment, pulp and paper mills, meat products, chemicals, and plastics.

After a few months' lag, manufacturing employment also experienced an upturn. Factory jobs rose to 19.4 million in 1988, more than 400,000 above the 1986 level. An analysis by Richard Devens found that manufacturing industries with higher ratios of exports to shipments had more rapid job growth over the first half of 1988 than did industries where exports were less important.[10]

Continued growth in U.S. exports is projected to buoy the manufacturing division through the coming decade. Exports (in constant dollars) are projected to post 4.7 percent yearly growth, compared with 2.3 percent for total GNP and 2.7 percent for imports. The much faster rate of growth for exports than for imports will result in a positive net trade balance over the nineties.

Most of the export growth will be concentrated in capital goods industries, in particular, computers. In fact, mainly because of the value of computer output, durable goods production will enjoy one of the fastest rates of output expansion of all the other major industries, 2.9 percent a year. Excluding the computer industry, however, lowers the rate of growth of real manufacturing output to 1.7 percent.

Valuing the output of the computer industry in constant dollars has been a question economists have been grappling with for some time.[11] Because of the explosive growth in processing ca-

Service-producing industries are projected to rise to 79.0 percent of all nonfarm wage and salary jobs, compared with 75.9 percent in 1988.

Table 6. Employment by industry, 1976, 1988, and projected to 2000

Industry	Standard Industrial Classification	Employment (thousands)					Annual rate of change, 1988–2000[1]	
		1976	1988	2000			Employment	Output
				Low	Moderate	High		
Total	—	89,942	118,104	127,118	136,211	144,146	1.2	2.3
Agriculture	01,02,07,08,09	3,371	3,259	2,797	3,125	3,315	−.3	1.9
Livestock and livestock products	pt. 01, pt. 02	1,105	777	540	606	643	−2.0	.8
Other agricultural products	pt. 01, pt. 02	1,749	1,516	1,134	1,290	1,349	−1.3	2.8
Agricultural services, forestry, and fishing	07,08,09	517	966	1,123	1,228	1,323	2.0	2.3
Private households	88	1,398	1,163	1,014	1,103	1,166	−.4	.8
Nonfarm self-employed and unpaid family	—	6,093	8,722	9,153	9,927	10,667	1.1	—
Nonfarm wage and salary[2]	—	79,080	104,960	114,154	122,056	128,998	1.3	—
Mining	10-14	779	721	656	705	827	−.2	.6
Metal mining	10	94	51	45	49	64	−.3	.5
Coal mining	11,12	225	151	116	122	139	−1.8	1.9
Crude petroleum, natural gas, and gas liquids	131,132	161	201	150	169	178	−1.4	−.3
Oil and gas field services	138	184	205	235	247	314	1.6	4.3
Nonmetallic minerals, except fuels	14	115	113	110	118	132	.4	1.0
Construction........................	15,16,17	3,576	5,125	5,504	5,885	6,318	1.2	2.1
Manufacturing	20-39	19,003	19,406	17,352	19,090	20,640	−.1	2.3
Durable manufacturing	24,25,32-39	11,080	11,436	10,160	11,220	12,255	−.2	2.9
Lumber and wood products	24	679	765	681	740	796	−.3	1.3
Logging camps and logging contractors	241	82	90	70	76	84	−1.4	1.5
Sawmills and planing mills	242	221	206	157	171	190	−1.5	1.1
Millwork and structural wood members, n.e.c.	2431,4,9	118	207	218	235	248	1.1	1.0
Veneer and plywood	2435,6	69	62	51	55	60	−.9	1.0
Wood containers and miscellaneous wood products	244,9	118	130	113	125	133	−.4	1.8
Mobile homes	2451	50	46	47	51	53	.8	1.4
Prefabricated wood buildings	2452	21	24	25	27	28	1.0	2.3
Furniture and fixtures	25	445	530	555	600	644	1.0	2.2
Household furniture	251	306	310	308	336	346	.7	1.7
Partitions and fixtures	254	55	79	92	99	112	1.9	1.6
Office and miscellaneous furniture and fixtures ..	252,3,9	84	141	155	166	186	1.4	3.2
Stone, clay, and glass products	32	645	600	528	580	607	−.3	1.6
Glass and glass products	321,2,3	192	156	123	135	138	−1.2	1.2
Hydraulic cement	324	30	20	15	16	18	−1.7	1.9
Concrete, gypsum, and plaster products	327	189	215	214	233	244	.7	1.9
Stone, clay, and miscellaneous mineral products	325,6,8,9	234	209	176	195	207	−.6	1.5
Primary metal industries	33	1,156	772	630	700	774	−.8	.6
Blast furnaces and basic steel products	331	549	277	217	241	270	−1.2	.2
Iron and steel foundries	332	223	138	112	124	135	−.9	.3
Primary aluminum	3334	31	26	18	21	23	−2.0	.5
Primary nonferrous metals, except aluminum	3331,2,3,9	36	18	11	13	15	−2.8	1.2
Miscellaneous primary and secondary metals	334,9	39	45	39	44	49	−.2	1.3
Copper rolling and drawing	3351	32	23	18	21	22	−.9	.7
Aluminum rolling and drawing	3353,4,5	67	65	53	59	64	−.8	.9
Nonferrous rolling and drawing, n.e.c	3356	16	15	10	11	12	−2.8	1.5
Nonferrous wire drawing and insulating	3357	80	77	63	71	77	−.6	1.5
Aluminum foundries	3361	46	54	58	64	71	1.5	.9
Nonferrous foundries, except aluminum	3362,9	37	34	30	33	36	−.2	.7
Fabricated metal products	34	1,511	1,431	1,230	1,352	1,458	−.5	.9
Metal cans and shipping containers	341	78	53	41	44	44	−1.5	.5
Cutlery, hand tools, and hardware	342	167	139	111	121	122	−1.1	.4
Plumbing and nonelectric heating equipment	343	63	60	53	57	60	−.4	.7
Fabricated structural metal products	344	455	429	371	406	437	−.5	.8
Screw machine products, bolts, rivets, etc	345	95	100	90	100	111	.0	1.8
Forgings	3462,3	54	38	27	29	33	−2.1	.9
Automotive stampings	3465	100	102	78	85	94	−1.5	1.5
Stampings, except automotive	3466,9	121	89	84	94	102	.4	2.0
Metal coating, engraving, and allied services	347	90	122	118	132	146	.7	1.8
Ordnance, except vehicles and missiles	348	58	76	60	65	76	−1.3	−1.3
Miscellaneous fabricated metal products	349	230	223	198	219	233	−.1	1.2
Machinery, except electrical	35	2,066	2,082	1,855	2,059	2,291	−.1	5.8
Engines and turbines	351	121	94	69	77	85	−1.6	1.1
Farm and garden machinery	352	162	104	98	107	116	.2	1.4

Table 6. Continued—Employment by industry, 1976, 1988, and projected to 2000

Industry	Standard Industrial Classification	Employment (thousands)					Annual rate of change, 1988–2000[1]	
		1976	1988	2000			Employment	Output
				Low	Moderate	High		
Construction machinery	3531	148	82	72	79	85	-.3	1.6
Mining and oil field machinery	3532,3	100	58	51	58	74	.0	1.2
Materials handling machinery and equipment	3534,5,6,7	88	87	80	87	94	.0	2.1
Metalworking machinery	354	307	314	271	298	319	-.4	1.4
Special industry machinery	355	183	171	147	162	167	-.4	1.2
General industrial machinery	356	286	249	229	256	269	.2	1.7
Electronic computing equipment	3573	215	418	398	453	556	.7	9.2
Office and accounting machines	3572,4,6,9	72	56	39	43	44	-2.2	2.4
Refrigeration and service industry machinery	358	160	185	173	188	203	.1	1.7
Miscellaneous nonelectrical machinery	359	224	264	226	251	282	-.4	1.5
Electrical and electronic equipment	36	1,775	2,071	1,794	2,014	2,126	-.2	2.8
Electric distributing equipment	361	116	107	91	100	109	-.5	1.4
Electrical industrial apparatus	362	222	184	151	169	183	-.7	2.0
Household appliances	363	170	139	107	117	118	-1.4	2.1
Electric lighting and wiring equipment	364	196	198	168	187	189	-.5	1.2
Electronic home entertainment equipment	365	120	85	61	70	70	-1.6	4.2
Telephone and telegraph apparatus	3661	137	111	77	84	85	-2.3	2.4
Radio and TV communication equipment	3662	308	456	424	463	535	.1	3.4
Electronic tubes	3671,2,3	40	39	28	32	34	-1.6	1.4
Semiconductors and related devices	3674	130	262	244	285	288	.7	4.5
Miscellaneous electronic components	3675,6,7,8,9	196	334	312	359	364	.6	2.4
Storage batteries, engine electrical parts	3691,4	95	98	81	92	94	-.5	1.6
X-ray and other electromedical apparatus	3693	18	32	32	36	38	.9	4.7
Electrical equipment and supplies, n.e.c.	3692,9	27	26	17	19	20	-2.4	2.9
Transportation equipment	37	1,798	2,050	1,823	2,002	2,292	-.2	1.6
Motor vehicles	371	881	856	720	786	883	-.7	1.5
Motor vehicles and car bodies	3711	416	357	289	311	351	-1.1	1.4
Motor vehicle parts and accessories	3714	399	406	339	375	419	-.7	1.8
Truck and bus bodies, trailers, and motor homes	3713,5,6	66	93	93	100	113	.6	1.3
Aircraft	3721	281	367	350	386	458	.4	2.0
Aircraft and missile engines and equipment	3724,8,3764,9	221	385	362	404	474	.4	2.1
Guided missiles and space vehicles	3761	70	155	157	171	201	.8	1.5
Ship and boat building and repairing	373	215	193	158	171	190	-1.0	.4
Railroad equipment	374	50	32	30	33	34	.2	.7
Miscellaneous transportation equipment	375,9	80	62	46	51	52	-1.7	2.5
Instruments and related products	38	576	749	749	822	895	.8	2.9
Engineering and scientific instruments	381	59	95	115	126	146	2.4	3.4
Measuring and controlling devices	382	180	260	245	271	296	.4	1.7
Optical and ophthalmic products	383,5	62	69	66	73	78	.5	5.1
Medical instruments and supplies	384	119	201	234	253	273	1.9	4.2
Photographic equipment and supplies	386	125	112	82	90	91	-1.8	2.0
Watches, clocks, and parts	387	31	12	7	9	11	-2.7	-1.3
Miscellaneous manufacturing	39	429	386	316	350	372	-.8	.6
Jewelry, silverware, and plated ware	391	58	54	47	54	64	-.1	1.0
Toys and sporting goods	394	121	104	84	94	103	-.8	.8
Manufactured products, n.e.c.	393,5,6,9	250	228	185	203	205	-1.0	.2
Nondurable manufacturing	20-23, 26-31	7,923	7,970	7,192	7,870	8,385	-.1	1.7
Food and kindred products	20	1,690	1,636	1,435	1,563	1,595	-.4	1.3
Meat products	201	345	402	377	415	422	.3	.9
Dairy products	202	191	159	142	153	155	-.3	.6
Canned, dried, and frozen foods	203	252	249	228	251	255	.1	2.5
Grain mill products and fats and oils	204,7	179	157	132	143	149	-0.8	1.7
Bakery products	205	237	203	167	176	178	-1.2	.2
Sugar and confectionery products	206	113	98	77	81	85	-1.6	.1
Alcoholic beverages	2082,3,4,5	81	72	50	55	58	-2.2	1.0
Soft drinks and flavorings	2086,7	140	130	105	115	117	-1.0	2.0
Miscellaneous foods and kindred products	209	152	166	158	174	175	.4	1.7
Tobacco manufactures	21	77	56	37	40	42	-2.8	-2.1
Textile mill products	22	919	729	574	627	683	-1.3	1.3
Weaving, finishing, yarn and thread mills	221,2,3,4,6,8	560	402	321	351	385	-1.1	1.1
Knitting mills	225	231	211	161	175	187	-1.5	.5
Floor covering mills	227	58	60	54	59	64	-.2	2.9
Miscellaneous textile goods	229	70	56	38	42	47	-2.3	1.4

Table 6. Continued—Employment by industry, 1976, 1988, and projected to 2000

Industry	Standard Industrial Classification	Employment (thousands)					Annual rate of change, 1988-2000[1]	
		1976	1988	2000			Employment	Output
				Low	Moderate	High		
Apparel and other textile products	23	1,318	1,093	853	920	976	-1.4	.9
Apparel	231-8	1,146	893	687	739	784	-1.6	.5
Miscellaneous fabricated textile products	239	172	200	166	181	192	-.8	1.9
Paper and allied products	26	676	693	629	690	740	.0	2.4
Pulp, paper, and paperboard mills	261,2,3,6	270	247	205	226	247	-.8	2.9
Converted paper products except containers	264	201	239	232	254	270	.5	2.1
Paperboard containers and boxes	265	205	207	191	210	223	.1	2.0
Printing and publishing	27	1,099	1,562	1,602	1,751	1,848	1.0	2.2
Newspapers	271	384	475	479	527	553	.9	1.1
Periodicals	272	71	130	138	149	156	1.1	1.2
Books	273	96	116	116	126	133	.7	1.4
Miscellaneous publishing	274	41	79	104	113	121	3.1	3.3
Commercial printing and business forms	275,6	392	603	597	652	692	.7	2.9
Greeting card publishing	277	21	24	23	25	26	.5	3.3
Blankbooks and bookbinding	278	56	77	83	90	95	1.3	2.0
Printing trade services	279	38	58	63	68	72	1.4	2.4
Chemicals and allied products	28	1,043	1,065	990	1,084	1,166	.1	1.9
Industrial chemicals	281,6	312	280	243	268	300	-.4	1.6
Plastics materials and synthetics	282	218	178	148	163	181	-.7	2.5
Drugs	283	171	231	244	264	272	1.1	3.0
Soap, cleaners, and toilet goods	284	128	160	155	169	174	.5	1.8
Paints and allied products	285	65	63	56	61	67	-.2	1.0
Agricultural chemicals	287	67	52	45	50	54	-.4	.2
Miscellaneous chemical products	289	82	101	98	108	118	.6	1.3
Petroleum and coal products	29	199	162	127	140	153	-1.2	1.5
Petroleum refining	291	157	122	95	106	115	-1.2	1.4
Miscellaneous petroleum and coal products	295,9	42	40	32	35	38	-1.2	1.9
Rubber and miscellaneous plastics products	30	639	830	852	941	1,027	1.0	3.0
Tires and inner tubes	301	104	84	58	66	70	-2.0	1.0
Rubber products, plastic hose and footwear	302,3,4,6	154	139	113	124	138	-.9	1.6
Miscellaneous plastics products	307	381	607	681	751	819	1.8	3.7
Leather and leather products	31	263	144	93	114	155	-1.9	-.6
Footwear, except rubber and plastic	313,4	174	90	57	70	108	-2.1	-.8
Luggage, handbags, and leather products, n.e.c.	311,5,6,7,9	89	54	37	44	47	-1.8	-.3
Transportation, communications, utilities	40-42,44-49	4,583	5,548	5,713	6,096	6,587	.8	2.4
Transportation	40-42, 44-47	2,680	3,334	3,456	3,705	4,000	.9	2.4
Railroad transportation	40	538	299	214	231	255	-2.1	1.5
Local and interurban passenger transit	41	264	313	310	329	346	.4	1.5
Trucking and warehousing	42	1,149	1,569	1,566	1,682	1,831	.6	2.1
Water transportation	44	195	174	152	161	168	-.6	1.6
Air transportation	45	374	644	772	828	890	2.1	3.8
Pipe lines, except natural gas	46	18	19	17	19	21	.0	1.0
Arrangement of passenger transportation	4722	--	175	244	261	279	3.4	4.9
Miscellaneous transportation services	471,4723;474,8	--	141	181	194	212	2.7	2.7
Communications	48	1,170	1,281	1,260	1,344	1,424	.4	3.3
Communications, except broadcasting	481,2,9	1,010	1,042	1,004	1,070	1,135	.2	3.3
Radio and television broadcasting	483	160	239	256	274	289	1.1	3.4
Public utilities	49	733	933	996	1,048	1,163	1.0	1.7
Electric utilities, including combined services	491,pt.493	438	572	576	597	681	.4	2.0
Gas utilities, including combined services	492,pt.493	213	209	196	211	231	.1	1.0
Water and sanitation, including combined services	494-7, pt. 493	82	152	225	240	252	3.9	3.6
Wholesale trade	50,1	4,546	6,029	6,463	6,936	7,457	1.2	2.9
Motor vehicles and automotive equipment	501	385	431	452	485	522	1.0	—
Machinery, equipment, and supplies	508	1,030	1,516	1,696	1,820	1,957	1.5	—
Groceries and related products	514	602	822	840	902	970	.8	—
Petroleum and petroleum products	517	232	202	187	200	215	-.1	—
Retail trade	52-59	13,208	19,110	21,251	22,875	23,812	1.5	2.1
Building materials and garden supplies	52	546	744	819	885	926	1.5	—

Table 6. Continued—Employment by industry, 1976, 1988, and projected to 2000

Industry	Standard Industrial Classification	Employment (thousands)					Annual rate of change, 1988–2000[1]	
		1976	1988	2000			Employment	Output
				Low	Moderate	High		
Department stores	531	1,731	2,039	2,169	2,344	2,453	1.2	—
Other general merchandise stores	533,9	424	422	462	499	523	1.4	—
Grocery stores	541	1,780	2,742	3,052	3,297	3,451	1.5	—
New and used car dealers	551,2	815	1,027	1,093	1,181	1,236	1.2	—
Auto and home supply stores	553	228	334	370	400	418	1.5	—
Gasoline service stations	554	626	627	649	701	734	.9	—
Clothing and accessory stores	561,2,5	598	870	873	943	987	.7	—
Furniture and home furnishings stores	571	328	461	509	549	575	1.5	—
Appliance, radio, TV, and music stores	572,3	212	341	406	439	459	2.1	—
Eating and drinking places	58	3,656	6,282	7,294	7,796	8,027	1.8	2.1
Drug stores and proprietary stores	591	475	595	611	660	691	.9	—
Miscellaneous shopping goods stores	594	471	860	1,045	1,129	1,182	2.3	—
Finance, insurance, and real estate	60-67	4,271	6,677	7,306	7,762	8,104	1.3	2.3
Banking	60	1,310	1,738	1,766	1,882	1,990	.7	2.7
Credit agencies and investment offices	61,7	539	1,104	1,333	1,416	1,454	2.1	2.2
Security and commodity brokers and exchanges	62	176	449	601	639	669	3.0	3.2
Insurance carriers	63	1,101	1,442	1,497	1,594	1,654	.8	2.3
Insurance agents, brokers, and service	64	351	640	745	793	823	1.8	2.3
Real estate	65,6	794	1,304	1,364	1,438	1,513	.8	2.2
Services[2]	70-86,89	14,243	24,971	31,644	33,717	35,258	2.5	2.8
Hotels and other lodging places	70	929	1,550	1,845	1,960	2,084	2.0	1.6
Personal services	72	870	1,174	1,333	1,418	1,454	1.6	1.6
Laundry, cleaning, and shoe repair	721,5	367	418	439	469	485	1.0	.4
Personal services, n.e.c.	722,9	137	294	402	428	437	3.2	3.1
Beauty and barber shops	723,4	297	382	409	435	444	1.1	1.1
Funeral service and crematories	726	69	80	82	86	87	.6	.6
Business services	73	2,174	5,570	7,778	8,311	8,987	3.4	3.5
Advertising	731	125	237	308	330	350	2.8	4.4
Services to dwellings and other buildings	734	405	785	966	1,028	1,093	2.3	3.3
Personnel supply services	736	304	1,369	2,079	2,218	2,377	4.1	3.6
Computer and data processing services	737	159	678	1,118	1,200	1,329	4.9	4.3
Research, management, and consulting	7391,2,7	—	811	1,114	1,190	1,323	3.2	3.3
Detective and protective services	7393	—	464	589	632	682	2.6	2.1
Equipment rental and leasing	7394	—	262	333	356	387	2.6	2.1
Photocopying, finishing, commercial art	7332,3,95	—	188	226	241	256	2.1	3.5
Credit reporting and business services, n.e.c.	732,5;7331,9; 7396,9	—	776	1,045	1,116	1,189	3.1	3.2
Auto repair, services, and garages	75	466	837	1,009	1,077	1,134	2.1	1.9
Automotive rentals, without drivers	751	86	164	212	227	245	2.7	1.9
Automobile parking, repair, and services	752,3,4	380	673	797	850	889	2.0	1.9
Miscellaneous repair shops	76	227	347	364	389	416	1.0	1.6
Electrical repair shops	762	63	110	133	142	149	2.1	1.8
Watch, clock, jewelry, and furniture repair	763,4	27	29	27	29	30	−.1	.2
Miscellaneous repair shops and related services	769	137	208	204	218	238	.4	1.7
Motion pictures	78	209	241	248	264	286	.7	1.3
Amusement and recreation services	79	637	918	1,082	1,152	1,180	1.9	3.4
Theatrical producers and entertainers	792	68	129	152	162	168	1.9	3.4
Bowling alleys and billiard establishments	793	100	98	86	91	93	−.6	−1.0
Commercial sports	794	72	88	88	94	96	.5	1.5
Amusement and recreation services, n.e.c.	791,9	397	603	756	805	822	2.4	3.9
Health services	80	4,350	7,144	9,535	10,139	10,355	3.0	3.3
Offices of health practitioners	801,2,3,4	963	1,850	2,641	2,810	2,869	3.5	2.7
Nursing and personal care facilities	805	809	1,319	1,793	1,907	1,946	3.1	3.9
Hospitals, private	806	2,363	3,300	3,994	4,245	4,339	2.1	3.3
Outpatient facilities, health services n.e.c.	807,8,9	215	675	1,107	1,177	1,202	4.7	4.6
Legal services	81	363	852	1,108	1,181	1,242	2.8	2.3
Educational services, private	82	1,013	1,557	1,676	1,780	1,826	1.1	2.0
Social, membership, and miscellaneous services	83,4,6,9	3,005	4,781	5,666	6,046	6,294	2.0	2.5
Individual and miscellaneous social services	832,9	277	571	784	834	850	3.2	2.7
Job training and related services	833	—	243	260	277	289	1.1	2.3

Table 6. **Continued—Employment by industry, 1976, 1988, and projected to 2000**

Industry	Standard Industrial Classification	Employment (thousands)					Annual rate of change, 1988–2000[1]	
		1976	1988	2000			Employment	Output
				Low	Moderate	High		
Child day-care services[3]	835	215	406	513	547	558	2.5	4.3
Residential care	836	158	391	577	615	627	3.8	4.3
Museums, noncommercial organizations n.e.c.	84;865,9;892	179	290	349	371	380	2.1	3.4
Business and professional associations	861,2	107	146	159	170	179	1.3	2.9
Labor, civic, and social organizations	863,4	442	517	517	551	563	.5	1.5
Religious organizations[3]	866	878	963	944	1,005	1,024	.4	1.2
Engineering and architectural services	891	387	724	879	946	1,039	2.3	2.3
Accounting, auditing, and services, n.e.c.	893,9	249	530	684	730	784	2.7	2.4
Government	—	14,871	17,373	18,265	18,989	19,995	.7	1.0
Federal Government	—	2,733	2,971	2,992	3,059	3,260	.2	.8
Federal enterprises	—	859	1,044	1,043	1,083	1,182	.3	2.8
U.S. Postal Service	—	671	830	844	878	959	.5	2.9
Federal electric utilities	—	33	35	32	32	38	-.7	2.0
Federal enterprises, n.e.c.	—	155	179	167	173	185	-.3	2.9
Federal general government	—	1,874	1,927	1,950	1,976	2,078	.2	-.1
State and local government	—	12,138	14,402	15,273	15,930	16,735	.8	1.2
State and local enterprises	—	676	890	909	965	1,026	.7	2.2
Local government passenger transit	—	122	205	211	224	237	.7	1.3
State and local electric utilities	—	60	82	87	90	104	.8	.2
State and local enterprises, n.e.c.	—	494	603	611	651	686	.6	2.8
State and local general government	—	11,462	13,512	14,364	14,965	15,708	.9	1.0
State and local government hospitals	—	1,010	1,069	1,104	1,150	1,207	.6	1.5
State and local government education	—	6,270	7,331	7,943	8,276	8,687	1.0	.8
State and local general government, n.e.c.	—	4,182	5,112	5,316	5,539	5,814	.7	1.0

[1] Rates based on moderate case.
[2] Excludes SIC 074,5,8 (agricultural services) and 99 (nonclassifiable establishments), therefore not exactly comparable with data published in *Employment and Earnings.*
[3] Does not meet usual publication criteria of BLS Current Employment Survey.

n.e.c. = Not elsewhere classified.

NOTE: Dash indicates not applicable or data not available.

pability, the price per unit of "computer power" has declined dramatically, thereby raising the value of real output of computer equipment. Using this pricing method, the growth rate of real computer output has averaged more than 25 percent per year for the past three decades. Projecting this output series forward, even with much more moderate assumptions about future technological changes in computers, yields a staggeringly high level of computer output by 2000. This leads to a question about the consistency of this pricing method with the method used in other industries.

Given this unresolved dilemma in valuing computer output, the projection of the precise level of computer equipment output (and exports and imports) possesses a great deal of uncertainty. However, a few general trends can be identified. Computer manufacturing is very likely to be one of the fastest growing industries, with domestic output, exports, and imports all rising sharply. Further, it is expected that computer exports will be larger than imports, maintaining the positive trade balance now enjoyed in that industry through the end of

the century.

Few other major groups within manufacturing are projected to have a positive trade balance—only instruments, food products, tobacco, printing and publishing, and chemicals. For all other major manufacturing groups, the value of imports in 2000 is projected to be higher than exports.

This is not a new phenomenon. Negative trade balances have been predominant for almost all major manufacturing sectors as far back as 1977. This condition clearly worsened in the 1984–86 period, but then eased in 1987 and 1988, and is projected to continue to improve as exchange rates stabilize and strong foreign economic growth spurs exports. However, it should be noted how important the assumption concerning computer exports is to future real manufacturing trade balances.

Domestic manufacturing

Other factors affecting manufacturing besides the foreign trade situation relate to domestic demand. Investment in producers' durable equip-

ment is projected to enjoy the second fastest rate of growth among all final demand categories, second only to exports. This will further bolster that portion of the manufacturing sector supplying capital goods. On the down side, defense expenditures are projected to actually fall in real terms as the buildup of the 1980's reaches an end. Defense demand for most types of equipment and supplies will be lower in 2000 than at present under the moderate case assumptions. Demand for manufactured goods from the consumer sector is projected to slow, especially for motor vehicles.

Consumer demand for new automobiles is slowing for several reasons. Demographic changes are limiting the market for new cars, specifically, slower population growth in general and an absolute decline in the number of first-time buyers (those ages 16–24). In addition, high relative prices, longer loan maturities, and extended warranties are encouraging consumers to hold onto their cars longer. These factors lead to reduced demand, but will be somewhat offset by the projection of sharply curtailed growth in auto imports. Because it is assumed that more foreign auto companies will open factories in the United States, and that the price of imported cars will rise even faster than domestic prices, imports are expected to decline slightly as a share of the total auto market.

Domestic production of motor vehicles is projected to expand slowly, 1.5 percent a year. Furthermore, continued innovations in factory automation will allow this output to be produced with fewer workers—auto employment is projected to fall from 856,000 in 1988 to 786,000 by 2000.

It has already been noted that the computer industry will enjoy the fastest rate of output growth of all manufacturing industries, indeed of all industries in the economy, even allowing for the difficulties inherent in measuring real computer output. Jobs in computer equipment manufacturing are also projected to expand, from 418,000 in 1988 to 453,000 in 2000. Many more of these jobs will be held by nonproduction workers, especially engineers, technicians, systems analysts, and managers. Industries related to computer manufacturing will also enjoy high production levels, for example, semiconductors and related devices and miscellaneous electronic components.

Other fast-growing manufacturing industries include those relating to health care. Output growth is projected to be very strong for optical and ophthalmic products (in particular, spectrographs and electron microscopes), x-ray and other electromedical apparatus, medical instruments and supplies, and drugs. These rank

among the fastest growing output industries in the whole economy. Employment is not very large in these industries, however, and only about 93,000 jobs are projected to be added.

The defense slowdown will have a significant impact on a selected number of manufacturing industries, but some of them will be able to recoup defense losses from alternative sources. Radio and TV communication equipment depended on defense purchases for more than 40 percent of its output in 1986, but will sell only 22 percent to defense in 2000. An absolute decline in real defense purchases is projected to be more than compensated for by a large rise in private investment purchases of communications equipment, particularly from the air transportation, broadcasting, and communications industries. Similarly, the aircraft industry relied on defense for more than half its market in 1986, but this share will drop to less than one-third by 2000. Exports and private purchases will buoy the production of U.S. aircraft and aircraft engines and equipment through the end of the century.

Ship building also will be affected by reduced defense demand, but boat building for the consumer market should take up some of the slack. Different establishments within the industry will be affected by this switch, but overall output of the ship and boat building industry is projected to remain essentially level through the next decade. Employment is projected to fall, however, from 193,000 to 171,000.

Among the heavy machinery industries, the recovery experienced in 1987 and 1988 is expected to moderate over time. The outlook for most of these sectors is for steady but modest output growth from 1988 to 2000, accompanied by slight declines in employment.

Many of these machinery industries rely on exports for about 10–30 percent of their market, and after losing domestic markets during the 1980–82 recessions, they suffered again during the years of the large trade imbalances. The upturn in exports in 1987 revived these industries, and some of them, such as materials handling equipment, refrigeration and service industry machinery, and miscellaneous machinery, have finally reestablished their 1979 prerecession real production levels. Many more still lag behind their prerecession peaks, however, including engines and turbines, farm and garden equipment, construction, mining, and oilfield machinery, metalworking machinery, special industry and general industrial machinery, and office and accounting machines. Furthermore, employment in virtually every machinery sector is far from the 1979 level despite some new hiring in 1987 and 1988, and it is unlikely to rise

Health and business services alone are projected to employ more than 18 million by the year 2000, an increase of almost one-third over their current levels.

any higher. Exports and domestic investment growth will support production in the heavy industrial sectors in the future at about a 1- to 2-percent annual rate, but output gains will be accomplished without additional workers.

The same is true for primary and fabricated metal industries. The foreign trade recovery in 1987 and 1988 boosted even those manufacturing industries previously identified as long-term losers. Imports halted their steady rate of market takeover, and key metals purchasers such as autos, heavy machinery, and construction supplies, had healthy production gains in 1988. Primary metals output was up almost 20 percent in real terms between 1986 and 1988, led by increases in steel, iron and steel foundries, aluminum, copper, and nonferrous wire drawing and insulation. Even employment experienced a turnaround. Steel, for example, added 9,000 jobs in 1988; previously, the steel industry posted nine continuous over-the-year declines.

However, the gains in metals, while large in percentage terms, were made from a very low base. Several years of plant closings and restructuring reduced the size of the primary metals industry in the United States. Domestic production levels in 1988 were still far below the peak years of the late seventies, and it is unlikely the industry will regain its former size. Substitute products and cheaper imports have virtually eliminated some of the demand for domestic metals. Employment in primary metals is projected to fall from 772,000 in 1988 to 700,000 in 2000, and fabricated metals will lose 79,000 jobs, reaching 1,352,000 in 2000. Many of the fabricated metal industries are linked to the slow-growing auto industry or to defense (ordnance).

Within the nondurable goods portion of manufacturing, food production is projected to rise faster than total population because of a significant increase in exports, particularly of grain mill products. Shifts are expected to occur among the various food industries, reflecting changing consumer preferences. Faster than average growth will be posted by canned, dried, and frozen foods, grain mill products, soft drinks and flavorings, and miscellaneous food products. Slower growth is expected for meat, dairy, bakery, and confectionery products and for alcoholic beverages. Most food industries will continue to invest in automated processing equipment, thereby raising productivity levels and reducing employment. The exception is meat products, where productivity improvements resulting from increased assembly line speed have reached a limit. Future gains are restricted by the necessity for many hand operations in red meat processing.

Slow population growth of only 0.7 percent a year will also be a factor limiting the apparel industry over the next decade. Demand is expected to grow faster than population because of rising income levels, but more of that demand will be met by imports. Apparel imports are projected to climb to more than 42 percent of the total market in 2000, compared with about 36 percent in 1987. As a result, domestic apparel output is projected to have only 0.5 percent annual growth, and employment will be cut back from 893,000 in 1988 to 739,000 in 2000, a reduction of 154,000 jobs. Textile industries will suffer from the slow growth of domestic apparel production, but can be expected to find strength in other markets, in particular, exports (affecting fabric mills) and construction (affecting floor covering mills).

Printing and publishing is one of the few manufacturing sectors where employment growth has been accelerating throughout the 1980's. The basis for this growth has been the rapid expansion of printed material (such as catalogs, specialty magazines, business forms, and school textbooks), and the low barriers to entry enticing many new small firms into the field. This has been especially true in commercial printing, where low initial investment costs have spurred the creation of many small companies to meet the growing demand from the trade, financial, business, and professional services sectors. Commercial printing posted 6.9 percent real output growth and 4.1 percent job growth each year over the 1982–88 period. Miscellaneous publishing, although smaller, boasted 9.6 percent output growth and 7.6 percent employment growth.

Future gains are projected to slow in printing and publishing as overall economic growth slows, but 189,000 new jobs are expected to be added, in contrast to actual declines in most other manufacturing sectors.

Alternative scenarios

This article has focused on the results of the moderate growth projection scenario, but two alternatives were also prepared. The alternatives show the effects of changes in some of the key assumptions of the macroeconomic model discussed by Norman C. Saunders on pp. 13–24 in this issue. In the high-growth scenario, output and employment grow more rapidly than in the moderate case because of a larger labor force and a much higher rate of growth of labor productivity. The low growth scenario is characterized by higher unemployment, inflation, increasing Federal and foreign trade deficits, and lower productivity growth. Employment

gains average 1.7 percent a year between 1988 and 2000 in the high alternative, 1.2 percent in the base case, and only 0.6 percent a year in the low alternative. Even the high-growth model does not match the 2.3-percent rate of growth in employment over the previous 12-year period.

Durable goods manufacturing falls proportionately more in the low-growth scenario than any of the other major industry divisions, because the capital goods export boom and strong business equipment purchases that characterize the moderate case do not occur in the low growth scenario. (See table 6, pp. 34–38.) Gov-

ernment employment, in contrast, represents a larger share of total employment in the slow growth scenario, although the absolute level of government jobs is lower than the base case.

In the high scenario, the greater number of jobs (than in the moderate case) is more evenly spread out among the major industry divisions, with the exception of manufacturing, which gets a substantially larger share. More than 26 million jobs are projected to be added overall during the 1988–2000 period in the high alternative, versus 18 million under the conditions of moderate growth. □

Footnotes

[1] "National health expenditures in 1986," *Health Care Financing Review*, Summer 1987, pp. 1–36.

[2] The Health Care Financing Administration data include not only private health care services (the BLS measure), but also government health care services, drugs and medical sundries, eyeglasses and appliances, program administration and net cost of private insurance, government public health activities, research, and construction of medical facilities. The BLS ratio is smaller for two other reasons. For one, the Health Administration's data are in current dollars, the BLS data, in constant (1982) dollars. Secondly, the Health Administration's ratio is a share of GNP or final value added, while the BLS ratio is based on gross duplicated output, which includes not only final value added but intermediate inputs as well.

It should be noted that measuring real output in medical care, as in many other service industries, is more difficult than measuring the real output of goods because of the lack of comprehensive price deflators. A program to develop service sector price measures is currently underway by BLS.

[3] *Vital and Health Statistics*, series 13 (National Center for Health Statistics, 1988).

[4] Group Health Association of America, Inc., Washington, DC.

[5] *Vital and Health Statistics*, 1988.

[6] "Projections of the population of the United States, 1987 to 2080," *Current Population Reports*, Series P-25, No. 1018 (Bureau of the Census, 1989).

[7] Data for 1975–85 are from *Current Population Reports*, Series P-25, Nos. 917 and 1022 (Bureau of the Census); data for 1988 and 2000 are from "Projections of the population," *Current Population Reports* (Bureau of Census).

[8] *Projections of Education Statistics to 1997-98, CS 88-607* (National Center for Education Statistics, September, 1988), p. 73.

[9] Diane E. Herz and Philip L. Rones, "Institutional barriers to employment of older workers," *Monthly Labor Review*, April 1989, pp. 14–21.

[10] Richard M. Devens, Jr., "Employment in the first half of 1988," *Monthly Labor Review*, August 1988, pp. 15–19.

[11] See "Improved deflation of purchases of computers," *Survey of Current Business*, March 1986, pp. 7–9.