



Projections of occupational employment, 1988–2000

The future occupational structure is projected to provide jobs for workers at all educational levels, but persons with the most education and training will enjoy the best job opportunities

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The total number of jobs is projected to increase by 18 million, or 15 percent, from 1988 to 2000, according to the Bureau of Labor Statistics moderate-growth scenario for the U.S. economy. Reflecting the slowing of labor force growth, the pace of increase in employment is expected to be only about half that of the previous 12-year period, 1976–88. Changes in the industrial composition of employment will have a major impact on the occupational structure, as will changes in technology, business practices, and other factors. In general, occupational growth will result in opportunities for workers at all levels of education. However, opportunities in the higher-paying occupations will necessarily be limited to persons with the education and other training such jobs require, effectively foreclosing an attractive and growing segment of the job market to those with low educational attainment or few practical skills.

This article discusses projected changes in the occupational structure of employment over the 1988–2000 period. It includes analyses of the impact of industry employment trends, technological change, and other factors on occupational employment; potential worker displacement stemming from occupations projected to decline; and the implications of the projections for education and training needs and for job opportunities for workers in minority groups. As indicated above, the discussion focuses on the moderate alternative of the three sets of occupa-

tional projections developed by BLS that are tied to the high, moderate, and low economic and industry employment projections alternatives presented elsewhere in this issue of the *Review*. The major differences among the alternatives are discussed at the end of the article.

Major occupational groups

Each of the three major occupational groups requiring the highest levels of educational attainment—executive, administrative, and managerial occupations; professional specialty occupations; and technicians and related support occupations—is projected to continue to grow more rapidly than the average for total employment over the 1988–2000 period. Employment in executive, administrative, and managerial occupations is expected to increase by 22 percent, which represents an increase of 2.7 million jobs from 1988 to 2000. (See table 1.) Much of the growth of this occupational group is expected to be in retail trade and in the services industry division, especially business services. The numbers of managers and administrators are expected to continue to expand through the year 2000 because of the increasing complexity of corporate activities and because of the startup of many small firms. However, the growth rate for this occupational group is projected to be significantly less than it was from 1976 to 1988 when executive, administrative, and managerial workers grew faster than any other major group, and

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more than twice as fast as total employment.

The number of workers in professional specialty occupations is projected to grow by 3.5 million, an increase of 24 percent. Much of this growth is due to the expected increase in demand for engineers; computer specialists; lawyers; health diagnosing and treating occupations; and teachers, except college and university. The professional specialty occupations group is expected to continue to grow faster than total employment and to increase its share of total employment from 12.4 percent in 1988 to 13.3 percent in 2000.

Employment of the technicians and related support occupations group is projected to grow by 32 percent, more rapidly than any other major occupational group. Over the 1976-88 period, this group also was among the fastest growing major occupational groups. Jobs for health technologists and technicians are expected to account for nearly half of the 1.2 million new technician jobs that will be added from 1988 to 2000. In addition, more than a quarter of a million new jobs are expected for engineering and science technicians and computer programmers.

Marketing and sales occupations, which expanded much more rapidly than total employment from 1976 to 1988, are expected to increase only slightly faster than average through 2000. The employment increase is expected to be about 2.6 million workers. Occupations in

this group are concentrated in industries expected to have average growth—wholesale and retail trade (excluding eating and drinking places).

Employment in administrative support occupations, including clerical, is expected to grow more slowly than average from 1988 to 2000. However, this group is expected to add 2.5 million jobs over the period and to remain the largest major occupational group. The group grew about as fast as total employment in the previous 12-year period, but technological innovations and greater utilization of office automation are expected to slow the future rate of growth. Some occupations in this group, however, such as computer operators, are expected to benefit from continued technological change requiring their skills and, as a result, to grow rapidly. Other occupations in this broad group that involve a great deal of contact with people, and therefore are not affected significantly by automation, also are expected to have average or higher-than-average rates of growth. Among these are hotel desk clerks, interview clerks, and receptionists. Typists and word processors, stenographers, and statistical clerks are among the declining occupations in this group.

Employment in the service occupations group is expected to increase by 23 percent from 1988 to 2000. With an increase of more than 4 million jobs, it will add more jobs than any other major occupational group. Food preparation and serv-

Table 1. Employment by major occupational group, 1988 and projected to 2000, moderate alternative projection, and percent change 1976-88 and 1988-2000

[Numbers in thousands]

Occupational title	1988		2000		Percent change	
	Number	Percent	Number	Percent	1976-88	1988-2000
Total, all occupations	118,104	100.0	136,211	100.0	29.5	15.3
Executive, administrative, and managerial occupations	12,104	10.2	14,762	10.8	66.4	22.0
Professional specialty occupations	14,628	12.4	18,137	13.3	44.6	24.0
Technicians and related support occupations	3,867	3.3	5,089	3.7	53.9	31.6
Marketing and sales occupations	13,316	11.3	15,924	11.7	46.1	19.6
Administrative support occupations, including clerical	21,066	17.8	23,553	17.3	27.8	11.8
Service occupations	18,479	15.6	22,651	16.6	28.2	22.6
Agricultural, forestry, fishing, and related occupations	3,503	3.0	3,334	2.4	-7.7	-4.8
Precision production, craft, and repair occupations	14,159	12.0	15,563	11.4	25.3	9.9
Operators, fabricators, and laborers	16,983	14.4	17,198	12.6	2.9	1.3

NOTE: The 1988 and 2000 employment data, and the projected change 1988-2000, are derived from data from the industry-occupation matrixes for each year. The data on 1976-88 percent change were derived from the Current Population Survey

data because a comparable industry-occupation matrix for 1976 is not available. The resulting comparison of change between 1976-88 and 1988-2000 consequently is only broadly indicative of trends.

ice, health service, and cleaning and building service occupations are expected to account for nearly three-fourths of the total employment increase in service occupations. Service jobs are expected to increase from 15.6 percent of total employment in 1988 to 16.6 percent in 2000.

The number of agricultural, forestry, fishing, and related workers is projected to decrease by 5 percent between 1988 and 2000. Although continuing a long-term trend, this projected rate of decline is slightly less than the 8-percent drop that occurred between 1976 and 1988.

The number of precision production, craft, and repair jobs is projected to grow more slowly than the average for total employment from 1988 to 2000, just as it did from 1976 to 1988. Nearly all of the 1.4 million total increase in jobs is expected to be in the construction and services industry divisions. In manufacturing, about 100,000 fewer workers in this major group are projected to be employed in 2000 than in 1988.

Employment in the operators, fabricators, and laborers group, which grew by only 3 percent from 1976 to 1988, is projected to grow by about 1 percent through the year 2000. Although a large decline of nearly three-fourths of a million jobs is projected in manufacturing, job gains in services; wholesale and retail trade; construction; and transportation, communications, and public utilities should result in a net gain of 215,000 jobs by 2000. This major group is expected to have the largest change in the share of total employment, declining from 14.4 percent in 1988 to 12.6 percent by 2000.

Occupational trends by industry

The occupational projections were developed through the use of industry-occupation employment matrixes. The 1988 matrix was used as the base year for the projections.¹ The 1988 occupational structure of each industry was projected to 2000 through an analysis of factors that are expected to change the structure, such as developments in technology, business practices and methods of operation, and product demand. An analysis of the 1988 and 2000 matrixes provides information on the occupational concentration within industries and expected changes in the occupational structure of industries over the period. The levels of employment in selected occupations for wage and salary workers by major industry division in 1988 and projected 2000 are shown in table 2. Also included are estimates of self-employed and unpaid family workers for the economy as a whole. The percent distributions of industry employment and of self-employed and unpaid family workers by occu-

pation are shown in table 3.

Of the 18 million increase in jobs projected between 1988 and 2000, 16.6 million are wage and salary jobs in the services-producing industries. (See table 2.) Only 521,000 more wage and salary jobs are projected in the goods-producing industries. Growth of 1 million self-employed and unpaid family workers is projected for the economy as a whole.

Within the goods-producing industries, the level of employment in mining is expected to remain almost unchanged between 1988 and 2000. The occupational structure of mining is expected to change very little. Administrative support occupations, including clerical, are expected to decrease slightly due to advances in office automation. Precision production, craft, and repair occupations are expected to increase slightly because employment in oil and gas extraction, which has a large proportion of these workers, is projected to grow faster than the rest of the mining industries.

Wage and salary worker employment in agriculture, forestry, and fishing is projected to increase by less than 100,000 through the year 2000. Most of the major occupational groups, except operators, fabricators, and laborers, are expected to experience a slight upturn in the share of employment at the expense of agriculture, forestry, and fishing occupations, which are projected to decline from 77.1 percent of employment in this sector in 1988 to 75.3 percent by 2000. This development is due entirely to a projected decline in the employment of the detailed occupation, farmworkers.

Employment in construction is expected to grow by 760,000 jobs by the year 2000. More than half of the increase is in the construction trades—occupations that are projected to increase slightly their share of construction employment. The only other sizable employment gain in construction is projected for operators, fabricators, and laborers (159,000 jobs), but the expected increase is not large enough to prevent this group of workers from declining as a percent of total employment.

Despite a projected loss of 314,000 jobs in manufacturing by the year 2000, several occupational groups are expected to experience significant gains—executive, administrative, and managerial occupations (164,000 jobs); professional specialty occupations (208,000), with more than half in engineering; and technicians and related support occupations (85,000 jobs). All three groups should increase their shares of total employment in manufacturing through the year 2000. Operators, fabricators, and laborers are expected to decline, both in absolute terms (down 714,000 jobs) and as a proportion of total

Major occupational groups with lower levels of educational attainment, except sales and service workers, are expected to grow more slowly than average.

Table 2. Employment of wage and salary workers in selected occupations by major industry division and of self-employed and unpaid family workers, 1988 and projected to 2000

[Numbers in thousands]

Occupation	Total, all industries		Self-employed and unpaid family workers		Goods-producing industries		Agriculture, forestry, and fishing		Mining		Construction		Manufacturing	
	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000
Total, all occupations	118,104	136,211	10,327	11,314	26,915	27,436	1,664	1,755	721	705	5,125	5,885	19,405	19,090
Executive, administrative, and managerial occupations	12,104	14,762	1,576	2,012	2,382	2,639	42	52	86	84	589	673	1,665	1,829
Management support occupations	3,428	4,187	266	316	612	674	7	8	28	26	129	144	448	496
Professional speciality occupations	14,628	18,137	1,364	1,582	1,365	1,598	61	79	56	57	35	41	1,213	1,421
Engineers	1,411	1,762	32	38	766	889	1	2	26	27	23	28	715	833
Computer, mathematical, and operations research analysts	503	763	30	52	108	140	0	0	4	4	2	2	102	133
Natural scientists	338	403	15	16	106	121	9	11	19	20	0	0	78	89
Lawyers and judicial workers	622	810	223	240	4	5	0	0	1	1	0	0	3	3
College and university faculty	846	869	0	0	0	0	0	0	0	0	0	0	0	0
Teachers, except college and university	4,251	5,026	141	167	2	1	1	0	0	0	0	0	1	1
Health diagnosing occupations	801	995	259	271	26	33	26	33	0	0	0	0	0	0
Health assessment and treating occupations	2,084	2,876	50	64	3	3	1	1	0	0	0	0	2	2
Technicians and related support occupations	3,867	5,089	93	113	687	781	19	24	22	22	27	31	618	704
Health technicians and technologists	1,645	2,211	38	47	23	25	7	9	0	0	0	0	15	15
Engineering and science technicians and technologists	1,273	1,559	18	21	546	608	8	10	18	18	25	28	495	552
Technicians, except health and engineering and science	949	1,319	37	46	118	148	3	4	4	4	2	3	108	137
Marketing and sales occupations	13,316	15,924	1,827	2,003	721	873	18	21	10	12	63	73	629	767
Administrative support occupations, including clerical	21,066	23,553	434	429	2,914	2,843	79	86	85	75	497	504	2,253	2,178
Computer operators and peripheral equipment operators	316	408	4	4	55	61	1	1	2	2	1	2	51	56
Secretaries, stenographers, and typists	4,517	4,991	113	119	663	600	25	30	25	22	170	176	443	372
Clerical supervisors and managers	1,183	1,319	2	2	128	125	0	0	5	4	7	7	116	114
Service occupations	18,479	22,651	1,186	1,431	357	347	22	22	7	6	18	19	310	299
Cleaning and building service occupations, except private household	3,312	3,960	183	268	222	217	12	12	3	3	10	10	198	193
Food preparation and service occupations	7,503	9,227	113	104	16	17	2	2	0	0	1	1	12	13
Health service occupations	1,833	2,450	26	31	1	2	1	2	0	0	0	0	0	0
Personal service occupations	2,062	2,625	822	982	2	2	2	2	0	0	0	0	0	0
Private household workers	902	860	0	0	0	0	0	0	0	0	0	0	0	0
Protective service occupations	2,129	2,610	10	12	71	61	3	3	2	2	6	7	59	50
Agriculture, forestry, fishing, and related occupations	3,503	3,334	1,534	1,244	1,393	1,426	1,283	1,322	1	1	6	6	104	97
Precision production, craft, and repair occupations	14,159	15,563	1,699	1,854	7,003	7,393	39	44	261	260	2,686	3,173	4,017	3,916
Construction trades	3,807	4,423	921	1,047	2,263	2,668	7	8	15	14	2,002	2,395	240	250
Mechanics, installers, and repairers	4,839	5,471	427	433	1,186	1,288	18	20	57	58	308	342	802	867
Operators, fabricators, and laborers	16,983	17,198	614	645	10,093	9,535	101	104	193	187	1,205	1,364	8,594	7,880
Machine setters, set-up operators, operators, and tenders	4,949	4,779	98	106	4,340	4,067	18	17	19	16	20	23	4,282	4,011
Hand workers, including assemblers and fabricators	2,528	2,266	85	87	2,165	1,890	4	4	10	10	33	37	2,117	1,839
Transportation and material moving machine and vehicle operators	4,612	5,154	332	356	1,238	1,297	35	38	127	127	342	402	734	730
Helpers, laborers, and material movers, hand	4,894	4,999	99	96	2,350	2,281	44	45	36	34	809	902	1,461	1,300

Table 2. Continued—Employment of wage and salary workers in selected occupations by major industry division and of self-employed and unpaid family workers, 1988 and projected to 2000

[Numbers in thousands]

Occupation	Service-producing industries		Transportation, communications, and utilities		Wholesale trade		Retail trade		Finance, insurance, and real estate		Services		Government	
	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000
Total, all occupations	80,862	97,461	5,548	6,096	6,028	6,936	19,110	22,875	6,676	7,762	34,526	44,228	8,974	9,563
Executive, administrative, and managerial occupations	8,146	10,111	440	514	698	797	1,595	1,956	1,504	1,850	2,833	3,818	1,076	1,176
Management support occupations	2,550	3,197	106	126	168	191	221	259	648	823	755	1,082	652	717
Professional specialty occupations	11,899	14,957	246	310	89	123	236	300	189	267	9,713	12,369	1,425	1,587
Engineers	613	835	79	102	24	33	3	4	16	21	306	463	185	211
Computer, mathematical, and operations research analysts	365	571	21	30	24	36	5	7	92	133	147	279	76	86
Natural scientists	217	266	3	4	4	5	0	0	1	1	115	151	94	105
Lawyers and judicial workers	395	565	2	3	0	0	0	0	17	23	263	405	113	134
College and university faculty	845	869	0	0	0	0	0	0	0	0	845	869	0	0
Teachers, except college and university	4,108	4,858	7	8	0	0	0	0	0	0	4,044	4,794	57	56
Health diagnosing occupations	516	691	0	0	0	0	4	5	1	1	465	641	46	43
Health assessment and treating occupations	2,031	2,809	0	0	1	1	104	126	4	5	1,789	2,534	133	143
Technicians and related support occupations	3,087	4,195	238	285	120	166	39	55	126	170	2,133	3,037	431	482
Health technicians and technologists	1,585	2,140	33	35	4	5	24	34	7	8	1,395	1,927	121	130
Engineering and science technicians and technologists	709	930	77	95	78	108	6	8	6	8	377	522	165	189
Technicians, except health and engineering and science	794	1,125	128	155	38	53	9	13	113	154	362	587	144	163
Marketing and sales occupations	10,768	13,048	273	370	1,576	1,906	7,206	8,524	736	933	911	1,243	67	73
Administrative support occupations, including clerical	17,718	20,280	1,383	1,482	1,674	1,824	1,663	1,854	3,459	3,815	6,936	8,738	2,603	2,568
Computer operators and peripheral equipment operators	257	343	19	23	37	45	14	17	59	74	101	156	26	28
Secretaries, stenographers, and typists	3,741	4,272	143	151	253	293	147	181	467	491	2,163	2,642	568	514
Clerical supervisors and managers	1,052	1,192	94	102	122	133	128	141	283	312	295	380	130	125
Service occupations	16,936	20,872	192	239	61	68	6,042	7,505	314	331	8,603	10,788	1,724	1,942
Cleaning and building service occupations, except private household	2,907	3,475	29	32	37	41	225	256	199	210	2,287	2,797	132	139
Food preparation and service occupations	7,374	9,106	12	12	14	16	5,485	6,846	27	30	1,774	2,140	63	62
Health service occupations	1,806	2,417	7	7	0	0	35	41	0	0	1,605	2,196	159	174
Personal service occupations	1,238	1,641	98	134	0	0	27	33	1	1	1,028	1,378	84	95
Private household workers	902	860	0	0	0	0	0	0	0	0	902	860	0	0
Protective service occupations	2,049	2,537	12	11	4	4	55	57	61	58	705	1,016	1,211	1,390
Agriculture, forestry, fishing, and related occupations	576	664	5	5	39	46	31	44	91	104	285	331	124	135
Precision production, craft, and repair occupations	5,457	6,315	1,111	1,137	619	732	1,149	1,341	229	263	1,410	1,840	939	1,003
Construction trades	622	708	74	72	20	25	53	66	29	33	139	180	307	332
Mechanics, installers, and repairers	3,226	3,751	745	756	414	490	727	847	178	205	843	1,115	320	338
Operators, fabricators, and laborers	6,276	7,018	1,662	1,756	1,152	1,274	1,149	1,296	28	30	1,701	2,065	585	598
Machine setters, set-up operators, operators, and tenders	511	606	8	8	54	55	42	46	2	2	378	469	27	25
Hand workers, including assemblers and fabricators	278	289	19	19	75	76	34	36	1	1	129	139	19	18
Transportation and material moving machine and vehicle operators	3,042	3,501	1,259	1,350	604	715	355	431	8	9	554	711	262	285
Helpers, laborers, and material movers, hand	2,445	2,622	376	378	419	428	718	783	16	17	641	746	276	270

manufacturing employment (from 44.3 percent in 1988 to 41.3 percent in 2000), but still should remain the largest major occupational group in this industry. Improved production processes, such as robotics, flexible manufacturing systems, and other technological innovations, are expected to adversely affect nearly all occupations in this major group. The expected loss of 102,000 jobs for precision production, craft, and repair occupations is not large enough to cause the occupational group to lose its share of total employment in manufacturing—about 21 percent in both 1988 and projected 2000.

Within the services-producing industries, the bulk of the 1988–2000 employment increase is expected in the services industry division—9.7 million additional wage and salary jobs out of total growth of 16.6 million.² The next largest projected increase is in retail trade (3.8 million jobs), followed by finance, insurance, and real estate (1.1 million); wholesale trade (908,000); government (589,000); and transportation, communications, and public utilities (548,000).

The largest impact of these projected gains by industry over the 1988–2000 period is in the service occupations group—4.2 million additional jobs by 2000. Of this total, not quite half are food preparation and service occupations. Large numbers of additional jobs in services-producing industries also are expected in administrative support occupations, including clerical, and marketing and sales occupations—2.6 million and 2.3 million jobs, respectively. There should be much smaller gains among the lesser skilled broad occupational groups for operators, fabricators, and laborers (742,000 jobs) and for agriculture, forestry, fishing, and related occupations (89,000).

Impressive jobs gains in the services-producing industries are projected for those occupational groups requiring the most education or training. Employment in professional specialty occupations, for example, is expected to grow by 3.1 million workers from 1988 to 2000, the second largest increase after that for service workers. Employment in executive, administrative, and managerial occupations is expected to grow by 2.0 million jobs; technicians and related support occupations by 1.1 million jobs; and precision production, craft, and repair occupations by 859,000 jobs. The projected job gain within the services-producing industries as a percent of the economy-wide job gain for each of these occupational groups is sizable. About 74 percent of the overall wage and salary employment increase in executive, administrative, and managerial occupations is expected in the services-producing industries.

Similarly, about 87 percent of the total wage

and salary job gain for professional specialty occupations; 91 percent of that for technicians and related support occupations; and 61 percent of that for precision production, craft, and repair occupations is projected to be in the services-producing industries.

An analysis of the occupational structure of the major divisions within the services-producing industries reveals that the three broad groups with the highest levels of educational attainment (managers, professionals, and technicians) are projected to increase their relative shares of employment at the expense of groups with lower educational levels. The only exception is wholesale trade for which a slight reduction in the relative share of managers by the year 2000 is projected due to the expectation that retailers will increasingly buy directly from manufacturers, thereby reducing the demand for buyers at the wholesale level. This decline will be offset by slight increases in the shares of technicians and related workers; marketing and sales occupations; and precision production, craft, and repair occupations. The demand for workers in the last group results from an increase in service and repair activities in this industry division.

The share of employment in the service occupations is expected to remain stable over the 1988–2000 period in all industry divisions within the services-producing industries, except in finance, insurance, and real estate, where it is expected to decline. The demand for service workers in these industries is not expected to keep pace with the rising demand for managers, professionals, and technicians, especially in health fields in the service industry division. Also, the relative share for precision production, craft, and repair occupations is projected to remain stable in all industry divisions except retail trade and transportation, communications, and public utilities, where such workers are expected to decline as a proportion of total employment.

Employment of self-employed and unpaid family workers, combined, is projected to increase by nearly 10 percent, from 10.3 million in 1988 to 11.3 million in 2000. All of the growth is expected to occur among self-employed workers, because jobs for unpaid family workers are projected to decline by 134,000. Workers in executive, administrative, and managerial occupations are expected to account for the largest share of the growth of self-employed workers (436,000), followed by workers in service occupations (245,000) and professional specialty occupations (218,000). Consistent with the long-run decline of the farm sector of the economy, employment of self-

Of the 18 million increase in jobs projected between 1988 and 2000, 16.6 million are wage and salary jobs in the services-producing industries.

Table 3. Percent distribution of wage and salary workers in selected occupations by major industry division and of self-employed and unpaid family workers, 1988 and projected to 2000

Occupation	Total, all industries		Self-employed and unpaid family workers		Goods-producing industries		Agriculture, forestry, and fishing		Mining		Construction		Manufacturing	
	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000
Total, all occupations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Executive, administrative, and managerial occupations	10.2	10.8	15.3	17.8	8.8	9.6	2.5	3.0	11.9	12.0	11.5	11.4	8.6	9.6
Management support occupations	2.9	3.1	2.6	2.8	2.3	2.5	4	.5	3.9	3.7	2.5	2.4	2.3	2.6
Professional specialty occupations	12.4	13.3	13.2	14.0	5.1	5.8	3.7	4.5	7.8	8.2	.7	.7	6.3	7.4
Engineers	1.2	1.3	.3	.3	2.8	3.2	.1	.1	3.6	3.8	.5	.5	3.7	4.4
Computer, mathematical, and operations research analysts	.4	.6	.3	.5	.4	.5	.0	.0	.5	.6	.0	.0	.5	.7
Natural scientists	.3	.3	.1	.1	.4	.4	.5	.6	2.7	2.9	.0	.0	.4	.5
Lawyers and judicial workers	.5	.6	2.2	2.1	.0	.0	.0	.0	.2	.2	.0	.0	.0	.0
College and university faculty	.7	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Teachers, except college and university	3.6	3.7	1.4	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Health diagnosing occupations	.7	.7	2.5	2.4	.1	.1	1.5	1.9	.0	.0	.0	.0	.0	.0
Health assessment and treating occupations	1.8	2.1	.5	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Technicians and related support occupations	3.3	3.7	.9	1.0	2.6	2.8	1.1	1.4	3.1	3.1	.5	.5	3.2	3.7
Health technicians and technologists	1.4	1.6	.4	.4	.1	.1	.4	.5	.0	.0	.0	.0	.1	.1
Engineering and science technicians and technologists	1.1	1.1	.2	.2	2.0	2.2	.5	.6	2.5	2.5	.5	.5	2.6	2.9
Technicians, except health and engineering and science	.8	1.0	.4	.4	.4	.5	.2	.2	.6	.6	.0	.0	.6	.7
Marketing and sales occupations	11.3	11.7	17.7	17.7	2.7	3.2	1.1	1.2	1.4	1.7	1.2	1.2	3.2	4.0
Administrative support occupations, including clerical	17.8	17.3	4.2	3.8	10.8	10.4	4.7	4.9	11.8	10.7	9.7	8.6	11.6	11.4
Computer operators and peripheral equipment operators	.3	.3	.0	.0	.2	.2	.1	.1	.3	.3	.0	.0	.3	.3
Secretaries, stenographers, and typists	3.8	3.7	1.1	1.1	2.5	2.2	1.5	1.7	3.5	3.1	3.3	3.0	2.3	2.0
Clerical supervisors and managers	1.0	1.0	.0	.0	.5	.5	.0	.0	.7	.6	.1	.1	.6	.6
Service occupations	15.6	16.6	11.5	12.7	1.3	1.3	1.3	1.3	.9	.9	.4	.3	1.6	1.6
Cleaning and building service occupations, except private household	2.8	2.9	1.8	2.4	.8	.8	.7	.7	.4	.4	.2	.2	1.0	1.0
Food preparation and service occupations	6.4	6.8	1.1	.9	.1	.1	.1	.1	.1	.1	.0	.0	.1	.1
Health service occupations	1.6	1.8	.3	.3	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0
Personal service occupations	1.7	1.9	8.0	8.7	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0
Private household workers	.8	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Protective service occupations	1.8	1.9	.1	.1	.3	.2	.2	.2	.3	.2	.1	.1	.3	.3
Agriculture, forestry, fishing, and related occupations	3.0	2.4	14.9	11.0	5.2	5.2	77.1	75.3	.1	.1	.1	.1	.5	.5
Precision production, craft, and repair occupations	12.0	11.4	16.5	16.4	26.0	26.9	2.4	2.5	36.1	36.9	52.4	53.9	20.7	20.5
Construction trades	3.2	3.2	8.9	9.3	8.4	9.7	.4	.4	2.1	2.0	39.1	40.7	1.2	1.3
Mechanics, installers, and repairers	4.1	4.0	4.1	3.8	4.4	4.7	1.1	1.1	7.9	8.3	6.0	5.8	4.1	4.5
Operators, fabricators, and laborers	14.4	12.6	5.9	5.7	37.5	34.8	6.1	5.9	26.8	26.6	23.5	23.2	44.3	41.3
Machine setters, set-up operators, operators, and tenders	4.2	3.5	.9	.9	16.1	14.8	1.1	1.0	2.7	2.3	.4	.4	22.1	21.0
Hand workers, including assemblers and fabricators	2.1	1.7	.8	.8	8.0	6.9	.3	.2	1.4	1.4	.7	.6	10.9	9.6
Transportation and material moving machine and vehicle operators	3.9	3.8	3.2	3.1	4.6	4.7	2.1	2.2	17.6	18.1	6.7	6.8	3.8	3.8
Helpers, laborers, and material movers, hand	4.1	3.7	1.0	.8	8.7	8.3	2.6	2.5	5.0	4.8	15.8	15.3	7.5	6.8

Table 3. Continued—Percent distribution of wage and salary workers in selected occupations by major industry division and of self-employed and unpaid family workers, 1988 and projected to 2000

Occupation	Services-producing industries		Transportation, communications, and utilities		Wholesale trade		Retail trade		Finance, insurance, and real estate		Services		Government	
	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000	1988	2000
Total, all occupations	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Executive, administrative, and managerial occupations	10.1	10.4	7.9	8.4	11.6	11.5	8.3	8.6	22.5	23.8	8.2	8.6	12.0	12.3
Management support occupations	3.2	3.3	1.9	2.1	2.8	2.8	1.2	1.1	9.7	10.6	2.2	2.4	7.3	7.5
Professional speciality occupations	14.7	15.3	4.4	5.1	1.5	1.8	1.2	1.3	2.8	3.4	28.1	28.0	15.9	16.6
Engineers	.8	.9	1.4	1.7	.4	.5	.0	.0	.2	.3	.9	1.0	2.1	2.2
Computer, mathematical, and operations research analysts	.5	.6	.4	.5	.4	.5	.0	.0	1.4	1.7	.4	.6	.9	.9
Natural scientists	.3	.3	.1	.1	.1	.1	.0	.0	.0	.0	.3	.3	1.1	1.1
Lawyers and judicial workers	.5	.6	.0	.0	.0	.0	.0	.0	.2	.3	.8	.9	1.3	1.4
College and university faculty	1.0	.9	.0	.0	.0	.0	.0	.0	.0	.0	2.4	2.0	.0	.0
Teachers, except college and university	5.1	5.0	.1	.1	.0	.0	.0	.0	.0	.0	11.7	10.8	.6	.6
Health diagnosing occupations	.6	.7	.0	.0	.0	.0	.0	.0	.0	.0	1.3	1.4	.5	.5
Health assessment and treating occupations	2.5	2.9	.0	.0	.0	.0	.5	.6	.1	.1	5.2	5.7	1.5	1.5
Technicians and related support occupations	3.8	4.3	4.3	4.7	2.0	2.4	.2	.2	1.9	2.2	6.2	6.9	4.8	5.0
Health technicians and technologists	2.0	2.2	.6	.6	.1	.1	.1	.1	.1	.1	4.0	4.4	1.4	1.4
Engineering and science technicians and technologists	.9	1.0	1.4	1.6	1.3	1.6	.0	.0	.1	.1	1.1	1.2	1.8	2.0
Technicians, except health and engineering and science	1.0	1.2	2.3	2.5	.6	.8	.0	.1	1.7	2.0	1.0	1.3	1.6	1.7
Marketing and sales occupations	13.3	13.4	4.9	6.1	26.1	27.5	37.7	37.3	11.0	12.0	2.6	2.8	.7	.8
Administrative support occupations, including clerical	21.9	20.8	24.9	24.3	27.8	26.3	8.7	8.1	51.8	49.1	20.1	19.8	29.0	26.9
Computer operators and peripheral equipment operators	.3	.4	.4	.4	.6	.7	.1	.1	.9	.9	.3	.4	.3	.3
Secretaries, stenographers, and typists	4.6	4.4	2.6	2.5	4.2	4.2	.8	.8	7.0	6.3	6.3	6.0	6.3	5.4
Clerical supervisors and managers	1.3	1.2	1.7	1.7	2.0	1.9	.7	.6	4.2	4.0	.9	.9	1.4	1.3
Service occupations	20.9	21.4	3.5	3.9	1.0	1.0	31.6	32.8	4.7	4.3	24.9	24.4	19.2	20.3
Cleaning and building service occupations, except private household	3.6	3.6	.5	.5	.6	.6	1.2	1.1	3.0	2.7	6.6	6.3	1.5	1.5
Food preparation and service occupations	9.1	9.3	.2	.2	.2	.2	28.7	29.9	.4	.4	5.1	4.8	.7	.6
Health service occupations	2.2	2.5	.1	.1	.0	.0	.2	.2	.0	.0	4.7	5.0	1.8	1.8
Personal service occupations	1.5	1.7	1.8	2.2	.0	.0	.1	.1	.0	.0	3.0	3.1	.9	1.0
Private household workers	1.1	.9	.0	.0	.0	.0	.0	.0	.0	.0	2.6	1.9	.0	.0
Protective service occupations	2.5	2.6	.2	.2	.1	.1	.3	.3	.9	.7	2.0	2.3	13.5	14.5
Agriculture, forestry, fishing, and related occupations	.7	.7	.1	.1	.6	.7	.2	.2	1.4	1.3	.8	.7	1.4	1.4
Precision production, craft, and repair occupations	6.7	6.5	20.0	18.6	10.3	10.6	6.0	5.9	3.4	3.4	4.1	4.2	10.5	10.5
Construction trades	.8	.7	1.3	1.2	.3	.4	.3	.3	.4	.4	.4	.4	3.4	3.5
Mechanics, installers, and repairers	4.0	3.8	13.4	12.4	6.9	7.1	3.8	3.7	2.7	2.6	2.4	2.5	3.6	3.5
Operators, fabricators, and laborers	7.8	7.2	29.9	28.8	19.1	18.4	6.0	5.7	.4	.4	4.9	4.7	6.5	6.3
Machine setters, set-up operators, operators, and tenders	.6	.6	.1	.1	.9	.8	.2	.2	.0	.0	1.1	1.1	.3	.3
Hand workers, including assemblers and fabricators	.3	.3	.3	.3	1.2	1.1	.2	.2	.0	.0	.4	.3	.2	.2
Transportation and material moving machine and vehicle operators	3.8	3.6	22.7	22.2	10.0	10.3	1.9	1.9	.1	.1	1.6	1.6	2.9	3.0
Helpers, laborers, and material movers, hand	3.0	2.7	6.8	6.2	6.9	6.2	3.8	3.4	.2	.2	1.9	1.7	3.1	2.8

employed and unpaid family workers in agriculture, forestry, fishing, and related occupations is projected to decline by nearly 290,000 from 1988 to 2000.

Detailed occupations

The Bureau has developed projections for nearly 500 detailed occupations. The growth rates among these occupations range from an increase of 76 percent to a decline of 44 percent, a much greater range than for the major occupational groups. The following discussion of detailed occupations points out occupations expected to grow rapidly and to add large numbers of jobs over the 1988–2000 period. Current and projected employment data on the detailed occupations that had total employment of 25,000 or more in 1988 are presented in table 4.

Fastest growing occupations. Reflecting the very rapid growth of the health services industries, half of the 20 occupations with the fastest projected growth rates are health service occupations. (See table 5.) The health-related occupation projected to grow most rapidly over the 1988–2000 period is medical assistants (70 percent). The next fastest growing occupation, home health aides, will be in great demand to serve the needs of the increasing population who are aged and ill but live at home. Other health occupations with rapid projected growth include: radiologic technicians and technologists, medical record technicians, medical secretaries, physical therapists, surgical technologists, physical and corrective therapy assistants and aides, and occupational therapists.

Rapid growth also is projected for occupations related to the continuing spread of computer technology. The number of data processing equipment repairers should increase rapidly to maintain the growing stock of computer and related equipment. Rapid growth of operations research analysts also is expected. These workers perform data analyses of the operations of manufacturing and other business organizations in order to improve efficiency. Their work often leads to changes in an organization's data processing methods. Computer systems analysts and computer programmers will be needed to improve methods of satisfying the expanding data processing needs of organizations.

Among other occupations with rapid employment growth, paralegals, the occupation with the fastest projected increase, is expected to benefit from the rapid growth of the legal services industry as well as increasing use of paralegals within the industry. Other growth occupations include securities and financial services

sales representatives, travel agents, and social welfare service aides.

Occupations with the largest job growth. In addition to rapidly growing occupations, occupations having the largest numerical increases are important in identifying careers that will provide favorable job opportunities. As can be seen in table 6, the rates of growth of some of the occupations expected to have the largest numerical increases are less than for the economy as a whole. Size of employment, however, has a major impact on numerical growth. All of the occupations in table 6 are among the largest in employment size. In addition to numerical growth, employment size also is a major factor in the number of openings that will occur, because of the need to replace workers who leave the labor force or transfer to other occupations.

Some of the occupations with the largest job growth are closely associated with an individual industry group. For the occupations in table 6, the industry groups are retail trade, health services, and educational services. These industries currently have high employment levels and all are projected to continue to grow.

Retail trade has the occupation with the largest expected job growth of all occupations—salespersons, retail, which is found in all retail trade industries. Within retail trade, the rapidly growing eating and drinking places industry has 3 of the top 20 occupations with the largest growth: waiters and waitresses; food counter, fountain, and related workers; and food preparation workers. Another retail trade occupation with a projected large increase is cashiers. Health services has the occupation with the second highest expected increase—registered nurses. Nursing aides and licensed practical nurses are two other occupations among the top 20 growth occupations which are found in health services. Educational services has two occupations in the top 20—secondary school teachers and kindergarten and elementary school teachers.

Other occupations that are expected to have large job gains are not as identifiable with an industry group and exhibit a wide range of skills and earnings levels. Janitors and cleaners, including maids and housekeeping cleaners, lead this group. Following closely behind in terms of employment gains are general managers and top executives, whose numbers are projected to grow because of the increasing complexity of industrial and commercial organizations. General office clerks are projected to increase as a result of recordkeeping needs and other office procedures for which no computer programs can be economically devised.

Most of the fastest growing occupations are in the health services and computer technology fields.

Table 4. Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988-2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Total, all occupations	118,104	127,118	136,211	144,146	9,015	18,107	26,043	8	15	22
Executive, administrative, and managerial occupations	12,104	13,764	14,762	15,656	1,661	2,658	3,552	14	22	29
Managerial and administrative occupations	8,675	9,841	10,575	11,209	1,165	1,900	2,534	13	22	29
Administrative services managers	217	257	274	291	40	57	73	18	26	34
Communication, transportation, and utilities operations managers	167	182	194	208	15	27	41	9	16	25
Construction managers	187	221	236	253	34	49	66	18	26	35
Education administrators	320	364	382	400	44	62	79	14	19	25
Engineering, mathematical, and natural sciences managers	258	315	341	371	57	83	113	22	32	44
Financial managers	673	750	802	848	77	130	176	12	19	26
Food service and lodging managers	560	670	721	755	109	161	195	20	29	35
General managers and top executives	3,030	3,269	3,509	3,710	239	479	680	8	16	22
Government chief executives and legislators	69	68	71	75	-1	2	6	-1	3	8
Industrial production managers	215	231	254	275	15	39	59	7	18	27
Marketing, advertising, and public relations managers	406	474	511	543	68	105	137	17	26	34
Personnel, training, and labor relations managers	171	194	208	221	23	38	50	14	22	30
Property and real estate managers	225	250	267	282	25	43	58	11	19	26
Purchasing managers	252	268	289	306	15	36	54	6	14	21
Management support occupations	3,428	3,923	4,187	4,447	495	759	1,018	14	22	30
Accountants and auditors	963	1,099	1,174	1,250	136	211	287	14	22	30
Budget analysts	62	68	72	77	6	10	15	10	17	25
Claims examiners, property and casualty insurance	30	35	37	38	5	7	8	16	23	28
Construction and building inspectors	56	61	64	68	5	8	12	9	14	21
Cost estimators	169	180	194	210	12	26	41	7	15	25
Employment interviewers, private or public employment service	81	107	113	121	26	33	40	32	40	50
Inspectors and compliance officers, except construction	130	143	148	156	12	18	26	9	14	20
Loan officers and counselors	172	196	209	217	25	37	46	14	22	27
Management analysts	130	164	176	188	34	46	57	26	35	44
Personnel, training, and labor relations specialists	252	286	305	323	34	53	71	14	21	28
Purchasing agents, except wholesale, retail, and farm products	206	219	236	254	14	30	48	7	15	23
Underwriters	103	126	134	139	22	30	35	22	29	34
Wholesale and retail buyers, except farm products	207	204	220	233	-3	13	26	-2	6	13
Professional specialty occupations	14,628	17,083	18,137	19,072	2,455	3,509	4,444	17	24	30
Engineers	1,411	1,625	1,762	1,933	214	351	522	15	25	37
Aeronautical and astronautical engineers	78	80	88	101	3	10	23	3	13	29
Chemical engineers	49	52	57	62	3	8	13	7	16	27
Civil engineers, including traffic engineers	186	206	219	236	20	32	49	10	17	26
Electrical and electronics engineers	439	565	615	676	126	176	237	29	40	54
Industrial engineers, except safety engineers	132	142	155	171	10	24	40	8	18	30
Mechanical engineers	225	247	269	294	23	44	69	10	20	31
Architects and surveyors	205	227	244	265	22	39	60	11	19	29
Architects, except landscape and marine	86	99	107	117	14	21	31	16	25	36
Surveyors	100	105	112	121	5	12	22	5	12	22
Life scientists	154	179	189	198	25	34	44	16	22	28
Agricultural and food scientists	25	29	30	32	4	5	7	14	21	29
Biological scientists	57	68	72	75	11	15	18	19	26	32
Foresters and conservation scientists	27	28	30	31	1	2	4	4	8	15
Computer, mathematical, and operations research analysts	503	712	763	823	209	259	320	41	52	63
Computer systems analysts	403	575	617	666	173	214	264	43	53	65
Operations research analysts	55	79	85	92	24	30	37	45	55	68
Physical scientists	184	201	215	231	17	31	47	9	17	26
Chemists	80	86	93	100	7	13	20	8	17	25
Geologists, geophysicists, and oceanographers	42	46	49	54	3	7	11	8	16	27
Social scientists	194	225	239	251	31	45	58	16	23	30
Economists	36	43	45	48	7	10	13	19	27	35
Psychologists	104	124	132	139	20	28	34	19	27	33

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Social, recreational, and religious workers	931	1,083	1,147	1,185	153	217	254	16	23	27
Clergy	185	186	199	204	0	13	19	0	7	10
Directors, religious activities and education	56	58	62	63	2	6	7	3	10	12
Human services workers	118	161	171	176	43	53	58	37	45	49
Recreational workers	186	209	221	229	24	35	43	13	19	23
Social workers	385	469	495	512	84	110	127	22	29	33
Lawyers and judicial workers	622	757	810	856	135	188	233	22	30	37
Judges, magistrates, and other judicial workers	40	45	47	50	5	7	10	13	18	24
Lawyers	582	712	763	806	130	181	224	22	31	38
Teachers, librarians, and counselors	5,379	5,937	6,228	6,499	558	849	1,121	10	16	21
Teachers, special education	275	304	317	332	29	43	57	11	16	21
Teachers, preschool	238	290	309	316	53	72	79	22	30	33
Teachers, kindergarten and elementary school	1,359	1,499	1,567	1,638	140	208	279	10	15	21
Teachers, secondary school	1,164	1,328	1,388	1,451	164	224	287	14	19	25
College and university faculty	846	831	869	908	-14	23	63	-2	3	7
Other teachers and instructors	490	514	545	571	24	55	81	5	11	17
Adult and vocational education teachers	467	493	523	548	27	56	81	6	12	17
Instructors, adult (nonvocational) education	227	250	268	282	22	41	54	10	18	24
Teachers and instructors, vocational education and training	239	243	255	266	4	16	27	2	7	11
Librarians, archivists, curators, and related workers	159	168	176	184	9	17	25	6	11	16
Librarians, professional	143	150	157	165	7	14	22	5	10	15
Counselors	124	150	157	164	26	33	41	21	27	33
Health diagnosing occupations	801	931	995	1,034	130	194	233	16	24	29
Dentists	167	175	189	196	8	22	30	5	13	18
Optometrists	37	40	43	45	3	6	8	9	16	21
Physicians	535	642	684	707	106	149	172	20	28	32
Veterinarians and veterinary inspectors	46	53	57	63	8	12	17	17	26	37
Health assessment and treating occupations	2,084	2,713	2,876	2,967	629	792	883	30	38	42
Dietitians and nutritionists	40	49	51	53	8	11	13	21	28	32
Pharmacists	162	192	206	215	30	44	52	18	27	32
Physician assistants	48	58	62	63	10	14	15	21	28	31
Registered nurses	1,577	2,069	2,190	2,258	491	613	680	31	39	43
Therapists	256	346	367	378	90	111	123	35	43	48
Occupational therapists	33	46	48	50	13	16	17	41	49	54
Physical therapists	68	101	107	110	32	39	42	48	57	62
Recreational therapists	26	33	35	36	8	10	11	29	37	41
Respiratory therapists	56	75	79	81	19	23	25	34	41	45
Speech-language pathologists and audiologists	53	64	68	71	11	15	18	21	28	33
Writers, artists, and entertainers	1,387	1,563	1,690	1,793	177	303	406	13	22	29
Artists and commercial artists	216	252	274	293	36	58	77	17	27	36
Designers	309	364	395	422	55	86	113	18	28	37
Musicians	229	233	251	261	4	22	32	2	9	14
Photographers and camera operators	105	116	125	132	11	20	27	10	19	26
Photographers	94	103	111	117	8	17	23	9	18	24
Producers, directors, actors, and entertainers	80	96	104	110	17	24	30	21	30	38
Public relations specialists and publicity writers	91	98	105	111	7	14	20	8	15	22
Radio and TV announcers and newscasters	57	63	67	71	6	11	14	11	19	25
Reporters and correspondents	70	75	82	87	5	12	16	7	16	23
Writers and editors, including technical writers	219	253	274	293	34	55	74	16	25	34
Technicians and related support occupations	3,867	4,766	5,089	5,384	900	1,222	1,517	23	32	39
Health technicians and technologists	1,645	2,085	2,211	2,281	440	566	636	27	34	39
Clinical lab technologists and technicians	242	272	288	296	30	46	54	12	19	22
Dental hygienists	91	100	107	109	10	16	18	11	18	20
Emergency medical technicians	76	82	86	90	5	10	14	7	13	18
Licensed practical nurses	626	806	855	881	180	229	255	29	37	41
Medical records technicians	47	71	75	77	24	28	30	51	60	64
Opticians, dispensing and measuring	49	61	65	67	11	16	18	22	31	36
Radiologic technologists and technicians	132	206	218	224	74	87	92	57	66	70
Surgical technologists	35	52	55	57	17	20	21	48	56	61

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Engineering and science technicians and technologists	1,273	1,446	1,559	1,690	173	286	417	14	22	33
Engineering technicians	722	858	926	1,007	136	204	285	19	28	39
Electrical and electronic engineering technicians and technologists	341	434	471	515	93	130	174	27	38	51
Drafters	319	331	358	389	12	39	71	4	12	22
Science and mathematics technicians	232	257	275	294	25	43	62	11	19	27
Technicians, except health and engineering and science	949	1,235	1,319	1,413	287	370	464	30	39	49
Aircraft pilots and flight engineers	83	101	108	117	18	26	34	22	31	41
Air traffic controllers	27	30	31	33	3	4	6	13	15	22
Broadcast technicians	27	18	19	20	-10	-8	-7	-36	-31	-27
Computer programmers	519	716	769	831	197	250	312	38	48	60
Legal assistants and technicians, except clerical	200	274	290	305	74	90	105	37	45	52
Paralegals	83	136	145	153	54	62	70	65	75	84
Title examiners and searchers	27	29	31	33	3	5	6	10	17	23
Technical assistants, library	54	56	59	62	2	5	7	4	9	14
Marketing and sales occupations	13,316	14,758	15,924	16,801	1,442	2,609	3,485	11	20	26
Cashiers	2,310	2,429	2,614	2,733	119	304	423	5	13	18
Counter and rental clerks	241	288	308	325	46	67	84	19	28	35
Insurance sales workers	423	448	481	503	25	58	80	6	14	19
Real estate agents, brokers, and appraisers	422	457	493	523	35	72	101	8	17	24
Brokers, real estate	70	77	84	89	8	14	19	11	20	27
Real estate appraisers	41	46	49	51	5	8	11	13	20	26
Sales agents, real estate	311	334	361	383	23	50	72	7	16	23
Salespersons, retail	3,834	4,225	4,564	4,785	391	730	951	10	19	25
Securities and financial services sales workers	200	289	309	325	89	109	125	45	55	63
Stock clerks, sales floor	1,166	1,241	1,340	1,406	75	174	240	6	15	21
Travel agents	142	204	219	235	62	77	93	43	54	66
Administrative support occupations, including clerical	21,066	22,092	23,553	24,925	1,026	2,487	3,859	5	12	18
Adjusters, investigators, and collectors	931	1,040	1,108	1,182	109	177	231	12	19	25
Adjustment clerks	231	258	278	295	27	47	63	12	20	27
Bill and account collectors	149	182	195	206	33	46	57	22	31	38
Insurance claims and policy processing occupations	420	448	476	494	28	56	74	7	13	18
Insurance adjusters, examiners, and investigators	145	164	175	181	19	29	36	13	20	25
Insurance claims clerks	103	108	115	119	5	11	16	5	11	15
Insurance policy processing clerks	171	175	186	193	4	15	22	2	9	13
Welfare eligibility workers and interviewers	91	98	102	107	6	11	16	7	12	18
Communications equipment operators	346	372	397	421	27	52	75	8	15	22
Telephone operators	330	354	378	400	25	49	71	7	15	21
Central office operators	43	34	36	39	-9	-6	-4	-20	-15	-10
Directory assistance operators	33	25	26	28	-8	-7	-5	-25	-21	-16
Switchboard operators	254	296	316	334	41	62	80	16	24	31
Computer operators and peripheral equipment operators	316	381	408	436	65	92	120	20	29	38
Computer operators, except peripheral equipment	275	331	354	379	56	80	104	20	29	38
Peripheral EDP equipment operators	42	50	54	58	9	12	16	21	29	38
Financial records processing occupations	2,849	2,674	2,866	3,034	-175	18	185	-6	1	7
Billing, cost, and rate clerks	323	311	333	352	-11	11	29	-3	3	9
Billing, posting, and calculating machine operators	99	84	89	95	-15	-9	-4	-15	-10	-4
Bookkeeping, accounting, and auditing clerks	2,252	2,119	2,272	2,405	-133	20	154	-6	1	7
Payroll and timekeeping clerks	176	160	172	183	-15	-4	7	-9	-2	4
Information clerks	1,316	1,648	1,757	1,845	333	441	529	25	34	40
Hotel desk clerks	113	134	142	151	21	29	38	18	26	34
Interviewing clerks, except personnel and social welfare	129	143	152	161	14	23	32	11	18	25
New accounts clerks, banking	108	121	129	135	13	21	27	12	19	25
Receptionists and information clerks	833	1,092	1,164	1,216	259	331	383	31	40	46
Reservation and transportation ticket agents and travel clerks	133	159	170	182	26	37	49	19	28	37

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988-2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Mail clerks and messengers	259	267	285	302	8	26	42	3	10	16
Mail clerks, except mail machine operators and postal service	136	130	137	146	-6	2	10	-5	1	7
Messengers	123	138	147	156	14	24	33	12	19	27
Postal clerks and mail carriers	665	679	707	772	14	41	107	2	6	16
Postal mail carriers	285	298	310	339	13	25	54	5	9	19
Postal service clerks	380	381	396	433	1	16	53	0	4	14
Material recording, scheduling, dispatching, and distributing occupations	2,278	2,313	2,490	2,665	35	212	387	2	9	17
Dispatchers	202	217	231	246	15	29	44	7	14	22
Dispatchers, except police, fire, and ambulance	137	149	160	172	12	23	34	9	16	25
Dispatchers, police, fire, and ambulance	64	68	71	74	3	6	10	5	10	15
Meter readers, utilities	49	42	45	49	-6	-4	0	-13	-9	-1
Order fillers, wholesale and retail sales	207	208	224	239	1	17	33	1	8	16
Procurement clerks	42	43	47	50	1	4	8	2	10	18
Production, planning, and expediting clerks	229	229	250	272	1	21	44	0	9	19
Stock clerks, stockroom, warehouse, or storage yard	778	783	841	896	5	63	118	1	8	15
Traffic, shipping, and receiving clerks	535	546	591	633	11	55	98	2	10	18
Weighers, measurers, checkers, and samplers, recordkeeping	40	41	45	49	1	5	8	3	12	21
Records processing occupations, except financial	933	927	990	1,046	-6	56	113	-1	6	12
Brokerage clerks	64	62	66	69	-2	2	5	-3	3	8
Correspondence clerks	29	35	37	39	6	8	10	20	27	34
File clerks	263	272	290	305	9	27	42	3	10	16
Library assistants and bookmobile drivers	105	106	111	116	1	6	11	1	6	11
Order clerks, materials, merchandise, and service	293	268	289	309	-26	-4	15	-9	-2	5
Personnel clerks, except payroll and timekeeping	129	133	141	149	4	12	21	3	9	16
Statement clerks	32	31	33	34	-1	1	3	-4	3	8
Secretaries, stenographers, and typists	4,517	4,688	4,991	5,272	171	474	755	4	10	17
Secretaries	3,373	3,701	3,944	4,165	328	571	792	10	17	23
Legal secretaries	263	309	329	347	46	67	84	18	25	32
Medical secretaries	207	307	327	334	100	120	127	49	58	61
Secretaries, except legal and medical	2,903	3,085	3,288	3,484	181	385	581	6	13	20
Stenographers	159	116	122	130	-43	-36	-29	-27	-23	-18
Typists and word processors	985	871	924	978	-115	-61	-8	-12	-6	-1
Other clerical and administrative support workers	6,856	7,101	7,554	7,971	445	898	1,315	7	13	20
Bank tellers	522	513	546	572	-9	24	50	-2	5	10
Clerical supervisors and managers	1,183	1,237	1,319	1,394	54	137	211	5	12	18
Court clerks	42	49	51	54	7	9	12	16	21	28
Credit authorizers, credit checkers, and loan and credit clerks	229	273	291	304	43	61	74	19	27	32
Credit checkers	35	41	44	46	6	9	12	18	26	34
Loan and credit clerks	151	180	192	199	30	41	49	20	27	32
Customer service representatives, utilities	102	113	120	129	11	18	26	11	17	26
Data entry keyers, except composing	431	383	410	437	-48	-21	6	-11	-5	2
Duplicating, mail, and other office machine operators	164	170	181	193	6	17	29	3	10	18
General office clerks	2,519	2,787	2,974	3,144	268	455	625	11	18	25
Proofreaders and copy markers	33	29	31	33	-5	-2	-1	-15	-7	-2
Real estate clerks	28	28	30	31	0	2	3	1	6	11
Statistical clerks	77	71	76	80	-6	-1	3	-8	-2	4
Teacher aides and educational assistants	682	789	827	861	107	145	179	16	21	26
Service occupations	18,479	21,244	22,651	23,612	2,765	4,172	5,133	15	23	28
Cleaning and building service occupations, except private household	3,312	3,722	3,960	4,166	409	648	853	12	20	26
Housekeepers, institutional	138	178	189	198	40	51	59	29	37	43
Janitors and cleaners, including maids and housekeeping cleaners	2,895	3,240	3,450	3,629	345	556	734	12	19	25
Pest controllers and assistants	48	53	56	60	4	8	12	9	16	24

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Food preparation and service occupations	7,503	8,646	9,227	9,543	1,143	1,724	2,040	15	23	27
Chefs, cooks, and other kitchen workers	2,755	3,133	3,341	3,458	378	586	702	14	21	25
Cooks, except short order	1,099	1,278	1,362	1,412	180	263	313	16	24	29
Bakers, bread and pastry	124	155	167	174	31	43	50	25	35	41
Cooks, institution or cafeteria	403	443	467	484	40	64	81	10	16	20
Cooks, restaurant	572	680	728	754	108	155	181	19	27	32
Cooks, short order and fast food	630	672	719	741	43	89	111	7	14	18
Food preparation workers	1,027	1,183	1,260	1,305	156	234	278	15	23	27
Food and beverage service occupations	4,458	5,174	5,526	5,710	716	1,068	1,252	16	24	28
Bartenders	414	473	506	523	59	92	109	14	22	26
Dining room and cafeteria attendants and bar helpers	448	542	578	597	94	130	149	21	29	33
Food counter, fountain, and related workers	1,626	1,747	1,866	1,927	121	240	301	7	15	19
Hosts and hostesses, restaurant, lounge, or coffee shop	183	224	239	247	41	56	64	22	31	35
Waiters and waitresses	1,786	2,188	2,337	2,415	402	551	629	22	31	35
Health service occupations	1,833	2,307	2,450	2,518	474	617	685	26	34	37
Dental assistants	166	185	197	201	20	31	36	12	19	21
Medical assistants	149	238	253	259	89	104	110	60	70	74
Nursing aides and psychiatric aides	1,298	1,603	1,703	1,752	305	405	454	24	31	35
Nursing aides, orderlies, and attendants	1,184	1,469	1,562	1,606	286	378	422	24	32	36
Psychiatric aides	114	134	141	146	19	27	31	17	24	28
Pharmacy assistants	70	83	89	92	13	19	22	19	27	32
Physical and corrective therapy assistants and aides	39	56	60	61	17	21	22	44	52	56
Personal service occupations	2,062	2,442	2,625	2,744	381	564	682	18	27	33
Amusement and recreation attendants	175	205	217	225	29	42	50	17	24	28
Baggage porters and bellhops	32	38	40	43	6	8	11	18	26	34
Barbers	76	70	76	79	-6	0	4	-8	0	5
Child care workers	670	790	856	901	120	186	231	18	28	34
Cosmetologists and related workers	649	678	731	763	29	82	114	4	13	18
Hairdressers, hairstylists, and cosmetologists	609	632	683	713	23	74	104	4	12	17
Manicurists	26	31	33	34	5	7	8	17	26	31
Flight attendants	88	114	123	132	26	34	43	29	39	49
Homemaker-home health aides	327	503	535	550	176	207	223	54	63	68
Home health aides	236	373	397	409	137	160	173	58	68	73
Social welfare service aides	91	130	138	141	39	47	50	43	52	55
Ushers, lobby attendants, and ticket takers	44	45	48	51	1	4	6	1	8	14
Private household workers	902	790	860	909	-112	-42	7	-12	-5	1
Child care workers, private household	375	319	347	367	-56	-28	-8	-15	-8	-2
Cleaners and servants, private household	477	427	464	491	-50	-13	14	-11	-3	3
Housekeepers and butlers	34	30	33	35	-4	-1	1	-11	-3	3
Protective service occupations	2,129	2,475	2,610	2,771	346	481	642	16	23	30
Correction officers and jailers	186	251	262	276	65	76	90	35	41	48
Firefighting occupations	291	307	321	337	16	29	46	5	10	16
Firefighters	233	246	257	270	13	24	37	6	10	16
Firefighting and prevention supervisors	47	49	51	54	2	4	7	5	9	15
Police and detectives	515	559	583	614	44	68	98	8	13	19
Police and detective supervisors	88	93	97	102	5	9	14	6	10	16
Police and detective investigators	61	64	66	70	3	5	9	5	9	15
Police patrol officers	367	403	421	442	36	54	76	10	15	21
Crossing guards	57	58	61	64	1	4	7	2	7	12
Guards	795	983	1,050	1,129	189	256	335	24	32	42
Other protective service workers	285	316	333	351	31	48	67	11	17	23
Detectives and investigators, except public	47	57	61	65	10	14	18	22	31	40
Sheriffs and deputy sheriffs	63	60	63	66	-3	0	3	-5	0	5
Agriculture, forestry, fishing, and related occupations	3,503	3,079	3,334	3,597	-424	-169	94	-12	-5	3
Animal caretakers, except farm	92	99	106	114	8	14	23	8	16	25
Farm occupations	984	768	840	922	-216	-144	-62	-22	-15	-6
Farm workers	938	717	785	863	-221	-153	-75	-24	-16	-8
Nursery workers	46	51	55	60	5	9	13	11	20	29

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Farm operators and managers	1,272	946	1,035	1,109	-326	-237	-163	-26	-19	-13
Farmers	1,141	800	875	932	-341	-266	-209	-30	-23	-18
Farm managers	131	146	160	177	15	29	46	12	22	35
Fishers, hunters, and trappers	54	56	60	64	1	6	10	2	10	17
Fishers, hunters, and trappers	47	48	51	55	0	4	7	0	9	16
Forestry and logging occupations	146	130	139	151	-16	-6	5	-11	-4	4
Forest and conservation workers	40	42	44	47	2	4	7	6	11	17
Timber cutting and logging occupations	106	87	95	104	-18	-10	-2	-17	-10	-2
Fallers and buckers	36	27	30	32	-9	-6	-4	-24	-17	-10
Logging tractor operators	29	25	27	30	-4	-2	1	-13	-6	4
Gardeners and groundskeepers, except farm	760	884	943	1,009	123	182	249	16	24	33
Supervisors, farming, forestry, and agricultural	79	77	83	91	-2	4	13	-2	5	16
Precision production, craft, and repair occupations	14,159	14,444	15,563	16,683	285	1,404	2,525	2	10	18
Blue-collar worker supervisors	1,797	1,788	1,930	2,074	-9	133	277	-1	7	15
Construction trades	3,807	4,119	4,423	4,734	312	617	927	8	16	24
Bricklayers and stone masons	167	179	193	207	13	26	40	8	16	24
Carpenters	1,081	1,166	1,257	1,344	85	175	262	8	16	24
Carpet installers	56	63	68	72	7	12	16	12	21	29
Concrete and terrazzo finishers	114	125	134	143	10	19	29	9	17	25
Drywall installers and finishers	152	166	178	191	13	26	39	9	17	25
Electricians	542	595	638	686	53	96	144	10	18	27
Glaziers	49	54	58	62	5	9	12	9	18	25
Hard tile setters	26	30	32	34	4	6	8	14	22	31
Highway maintenance workers	175	182	190	200	7	15	25	4	9	14
Insulation workers	64	72	77	83	7	12	18	11	19	28
Painters and paperhangers, construction and	431	465	501	535	34	70	104	8	16	24
Paving, surfacing, and tamping equipment	70	77	82	87	7	12	17	10	17	24
Pipelayers and pipelaying fitters	52	56	59	63	3	7	11	7	13	22
Plasterers	26	27	29	31	0	2	4	1	8	16
Plumbers, pipefitters, and steamfitters	396	437	469	503	41	73	107	10	18	27
Roofers	123	136	147	157	13	24	34	11	19	28
Structural and reinforcing metal workers	78	86	92	98	8	14	21	11	18	27
Extractive and related workers, including blasters	230	225	239	274	-5	9	44	-2	4	19
Oil and gas extraction occupations	82	84	89	110	2	7	28	3	9	35
Roustabouts	39	37	39	48	-2	0	9	-5	1	24
Mechanics, installers, and repairers	4,839	5,098	5,471	5,836	259	633	997	5	13	21
Communications equipment mechanics, installers,	113	88	94	100	-24	-19	-13	-22	-16	-11
and repairers	75	56	59	63	-19	-15	-12	-25	-21	-16
Central office and PBX installers and repairers	533	549	586	631	16	53	98	3	10	18
Electrical and electronic equipment mechanics,	71	106	115	125	35	44	54	50	61	76
installers, and repairers	104	116	122	134	11	18	29	11	17	28
Data processing equipment repairers	44	46	49	52	2	6	8	4	13	19
Electrical powerline installers and repairers	79	87	92	99	8	13	20	10	17	25
Electronic home entertainment equipment	58	44	47	49	-14	-12	-9	-25	-20	-15
repairers	127	94	100	106	-33	-27	-21	-26	-21	-16
Electronics repairers, commercial and industrial	1,620	1,777	1,910	2,038	157	290	418	10	18	26
equipment	463	496	538	580	33	75	117	7	16	25
Station installers and repairers, telephone	1,080	1,199	1,282	1,359	119	202	279	11	19	26
Telephone and cable TV line installers and	77	83	90	99	6	13	22	8	17	28
repairers	1,598	1,738	1,868	1,984	140	270	386	9	17	24
Machinery and related mechanics, installers, and	463	496	538	580	33	75	117	7	16	25
repairers	1,080	1,199	1,282	1,359	119	202	279	11	19	26
Industrial machinery mechanics	77	83	90	99	6	13	22	8	17	28
Maintenance repairers, general utility	1,598	1,738	1,868	1,984	140	270	386	9	17	24
Millwrights										
Vehicle and mobile equipment mechanics and										
repairers										

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Aircraft mechanics and engine specialists	124	135	144	157	11	20	33	9	16	27
Aircraft mechanics	106	116	124	135	10	18	29	9	17	28
Automotive body and related repairers	214	251	270	284	37	56	70	17	26	33
Automotive mechanics	771	833	898	947	62	126	175	8	16	23
Bus and truck mechanics and diesel engine specialists	269	292	312	335	23	43	66	8	16	24
Farm equipment mechanics	54	51	55	59	-3	1	5	-6	1	9
Mobile heavy equipment mechanics	108	116	124	134	8	16	26	7	14	24
Motorcycle, boat, and small engine mechanics	58	60	65	69	3	8	12	5	13	20
Small engine specialists	43	47	50	53	4	8	11	9	18	25
Other mechanics, installers, and repairers	975	945	1,013	1,083	-30	39	108	-3	4	11
Coin and vending machine servicers and repairers	27	25	27	28	-2	0	1	-7	1	5
Heat, air conditioning, and refrigeration mechanics and installers	225	245	263	281	20	38	55	9	17	25
Home appliance and power tool repairers	76	71	76	81	-6	0	4	-8	0	5
Office machine and cash register servicers	56	53	57	61	-3	1	5	-6	1	9
Precision instrument repairers	46	46	50	55	0	4	8	0	8	18
Tire repairers and changers	88	93	100	105	5	12	17	6	14	20
Production occupations, precision	3,190	2,941	3,208	3,453	-249	18	263	-8	1	8
Assemblers, precision	354	236	263	291	-118	-91	-63	-33	-26	-18
Aircraft assemblers, precision	31	28	31	36	-3	-1	5	-11	-2	16
Electrical and electronic equipment assemblers, precision	161	81	91	99	-80	-71	-62	-50	-44	-39
Electromechanical equipment assemblers, precision	59	47	53	58	-11	-6	0	-19	-10	0
Machine builders and other precision machine assemblers	55	42	47	51	-13	-8	-4	-23	-15	-6
Food workers, precision	332	314	340	353	-18	7	21	-5	2	6
Bakers, manufacturing	41	37	40	40	-4	-1	0	-9	-3	-1
Butchers and meatcutters	258	248	269	281	-9	12	23	-4	4	9
Inspectors, testers, and graders, precision	676	579	634	688	-96	-42	12	-14	-6	2
Metal workers, precision	969	943	1,030	1,119	-25	61	151	-3	6	16
Boilermakers	25	25	27	29	0	2	4	1	9	18
Jewelers and silversmiths	35	38	41	44	2	6	9	6	16	26
Machinists	397	395	433	472	-1	36	75	0	9	19
Sheet metal workers and duct installers	246	238	257	277	-8	11	31	-3	4	13
Tool and die makers	152	145	159	173	-8	7	21	-5	4	14
Printing workers, precision	105	104	114	120	0	9	16	0	9	15
Compositors and typesetters, precision	26	23	25	27	-3	-1	0	-13	-5	1
Lithography and photoengraving workers, precision	44	46	51	54	3	7	10	6	16	23
Textile, apparel, and furnishing workers, precision	293	293	319	341	0	26	48	0	9	16
Custom tailors and sewers	130	135	146	155	4	16	24	3	12	19
Shoe and leather workers and repairers, precision	32	28	32	38	-4	0	7	-12	0	21
Upholsterers	73	74	81	85	2	8	12	2	11	17
Woodworkers, precision	227	230	249	265	3	22	39	1	10	17
Other precision workers	236	241	260	275	5	25	40	2	10	17
Dental lab technicians, precision	51	52	56	57	2	5	7	3	10	14
Optical goods workers, precision	26	30	33	35	5	7	9	18	28	35
Plant and system occupations	296	274	291	313	-22	-5	17	-8	-2	6
Chemical plant and system operators	35	25	28	30	-10	-7	-4	-28	-20	-12
Electric power generating plant operators, distributors, and dispatchers	45	49	51	56	4	6	11	9	14	25
Power generating and reactor plant operators	25	28	29	32	3	4	7	11	17	28
Gas and petroleum plant and system occupations	30	20	22	24	-9	-7	-5	-31	-24	-17
Stationary engineers	36	34	36	38	-3	0	2	-7	-1	5
Water and liquid waste treatment plant and system operators	76	83	87	92	7	11	16	9	14	21
Operators, fabricators, and laborers	16,983	15,888	17,198	18,417	-1,095	215	1,434	-6	1	8
Machine setters, set-up operators, operators, and tenders	4,949	4,373	4,779	5,136	-575	-170	187	-12	-3	4

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988–2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Numerical control machine tool operators and tenders, metal and plastic	64	63	70	77	-1	6	13	-1	9	21
Combination machine tool setters, set-up operators, operators, and tenders	89	88	97	105	-1	8	17	-1	9	19
Machine tool cut and form setters, operators, and tenders, metal and plastic	791	678	747	814	-114	-45	23	-14	-6	3
Drilling and boring machine tool setters and set-up operators, metal and plastic	56	49	54	59	-7	-2	3	-12	-3	6
Grinding machine setters and set-up operators, metal and plastic	72	64	70	77	-8	-1	5	-11	-2	7
Lathe and turning machine tool setters and set-up operators, metal and plastic	89	78	86	94	-11	-3	5	-12	-3	6
Machine forming operators and tenders, metal and plastic	184	151	166	180	-33	-18	-5	-18	-10	-2
Machine tool cutting operators and tenders, metal and plastic	148	121	133	146	-27	-15	-2	-18	-10	-1
Punching machine setters and set-up operators, metal and plastic	51	45	50	54	-6	-1	3	-11	-2	6
Metal fabricating machine setters, operators, and related workers	149	122	134	145	-27	-15	-4	-18	-10	-3
Metal fabricators, structural metal products	40	36	39	42	-4	-1	2	-10	-2	5
Welding machine setters, operators, and tenders	99	78	86	93	-21	-14	-6	-21	-14	-6
Metal and plastic processing machine setters, operators, and related workers	392	363	401	437	-29	9	45	-7	2	11
Electrolytic plating machine operators and tenders, setters and set-up operators, metal and plastic	44	37	41	44	-8	-4	0	-17	-8	0
Metal molding machine operators and tenders, setters and set-up operators	35	31	35	38	-4	-1	2	-12	-2	7
Plastic molding machine operators and tenders, setters and set-up operators	144	159	176	191	15	32	47	11	22	33
Printing, binding, and related workers	422	442	482	512	20	60	89	5	14	21
Bindery machine operators and set-up operators	63	65	71	75	2	7	12	3	11	18
Printing press operators	239	251	274	291	12	35	52	5	15	22
Offset lithographic press operators	91	105	114	121	14	23	30	15	25	33
Printing press machine setters, operators and tenders	108	109	119	126	0	10	18	0	9	17
Typesetting and composing machine operators and tenders	39	41	45	47	2	6	8	5	14	21
Textile and related setters, operators, and related workers	1,161	956	1,036	1,107	-205	-125	-54	-18	-11	-5
Pressing machine operators and tenders, textile, garment, and related materials	87	89	95	100	2	8	12	2	9	14
Sewing machine operators, garment	620	493	531	565	-127	-89	-56	-21	-14	-9
Sewing machine operators, nongarment	143	124	135	144	-19	-8	1	-14	-6	1
Textile bleaching and dyeing machine operators and tenders	26	21	23	25	-5	-4	-2	-21	-13	-6
Textile draw-out and winding machine operators and tenders	227	180	197	215	-47	-30	-12	-21	-13	-5
Textile machine setters and set-up operators	37	31	33	36	-6	-3	0	-17	-9	0
Woodworking machine setters, operators, and other related workers	149	148	161	172	-1	12	23	-1	8	15
Head sawyers and sawing machine operators and tenders, setters, and set-up operators	80	79	86	92	-1	6	12	-1	7	16
Woodworking machine operators and tenders, setters, and set-up operators	69	69	75	80	0	6	11	-1	8	15
Other machine setters, set-up operators, operators, and tenders	1,731	1,514	1,652	1,766	-217	-79	35	-13	-5	2
Cement and gluing machine operators and tenders	40	32	36	40	-8	-4	0	-20	-11	-1
Chemical equipment controllers, operators, and tenders	70	54	59	65	-16	-11	-5	-23	-15	-8

Table 4. Continued—Civilian employment in occupations with 25,000 workers or more, actual 1988 and projected to 2000, under low, medium, and high scenarios for economic growth

[Numbers in thousands]

Occupation	Total employment				1988-2000 employment change					
	1988	2000			Number			Percent		
		Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Crushing and mixing machine operators and tenders	136	107	117	126	-29	-19	-10	-21	-14	-7
Cutting and slicing machine setters, operators and tenders	91	73	80	86	-18	-11	-5	-20	-12	-5
Electronic semiconductor processors	38	29	34	35	-9	-4	-3	-23	-11	-9
Extruding and forming machine setters, operators, and tenders	100	96	106	114	-3	6	14	-3	6	14
Furnace, kiln, oven, drier, or kettle operators and tenders	62	47	52	56	-15	-11	-6	-24	-17	-10
Laundry and drycleaning machine operators and tenders, except pressing	169	195	208	216	25	39	47	15	23	28
Packaging and filling machine operators and tenders	286	232	254	266	-54	-33	-21	-19	-11	-7
Painting and coating machine operators	159	153	168	181	-6	9	22	-4	5	14
Coating, painting, and spraying machine operators, tenders, setters, and set-up operators	113	112	123	133	-1	10	20	-1	9	18
Painters, transportation equipment	46	41	45	48	-5	-2	2	-11	-4	4
Paper goods machine setters and set-up operators	54	51	56	60	-2	3	6	-4	5	12
Photographic processing machine operators and tenders	49	53	57	62	5	9	13	10	18	27
Hand workers, including assemblers and fabricators	2,528	2,067	2,266	2,430	-461	-262	-98	-18	-10	-4
Cannery workers	71	63	70	71	-8	-1	-1	-11	-2	-1
Cutters and trimmers, hand	63	59	65	69	-4	2	6	-6	3	10
Electrical and electronic assemblers	237	119	134	144	-118	-103	-93	-50	-44	-39
Grinders and polishers, hand	84	67	74	80	-17	-11	-4	-21	-13	-5
Machine assemblers	47	37	41	45	-9	-5	-2	-20	-12	-4
Meat, poultry, and fish cutters and trimmers, hand	110	117	129	131	7	18	20	6	17	19
Painting, coating, and decorating workers, hand	45	40	43	46	-6	-2	1	-12	-4	2
Solderers and brazers	29	25	27	29	-4	-2	0	-15	-6	1
Welders and cutters	325	285	309	337	-40	-16	12	-12	-5	4
Transportation and material moving machine and vehicle operators	4,612	4,803	5,154	5,516	192	542	904	4	12	20
Motor vehicle operators	3,300	3,550	3,808	4,064	251	508	764	8	15	23
Bus drivers	506	564	593	622	59	88	116	12	17	23
Bus drivers	157	166	175	184	9	18	27	6	12	17
Bus drivers, school	349	399	418	438	50	70	89	14	20	25
Taxi drivers and chauffeurs	109	127	137	145	18	28	37	16	26	34
Truck drivers	2,641	2,808	3,024	3,240	167	382	599	6	14	23
Driver-sales workers	242	236	255	267	-6	13	25	-2	5	10
Truck drivers, light and heavy	2,399	2,572	2,768	2,973	173	369	574	7	15	24
Rail transportation workers	106	84	90	99	-22	-16	-7	-21	-15	-7
Railroad brake, signal, and switch operators	37	27	29	32	-11	-9	-6	-28	-23	-15
Railroad conductors and yardmasters	27	20	21	24	-7	-5	-3	-25	-20	-11
Water transportation and related workers	148	140	149	158	-8	1	10	-5	1	7
Material moving equipment operators	1,010	972	1,047	1,131	-38	37	121	-4	4	12
Crane and tower operators	60	61	66	73	2	7	13	3	11	22
Excavation and loading machine operators	76	78	84	90	2	8	15	3	10	19
Grader, dozer, and scraper operators	86	90	96	105	3	10	19	4	11	22
Industrial truck and tractor operators	421	369	400	429	-52	-21	8	-12	-5	2
Operating engineers	158	168	179	191	11	21	34	7	13	22
Helpers, laborers, and material movers, hand	4,894	4,644	4,999	5,335	-251	105	441	-5	2	9
Freight, stock, and material movers, hand	884	837	905	963	-47	21	79	-5	2	9
Hand packers and packagers	635	516	560	596	-119	-75	-39	-19	-12	-6
Helpers, construction trades	555	592	633	681	37	78	126	7	14	23
Machine feeders and offbearers	249	199	218	232	-50	-31	-17	-20	-13	-7
Parking lot attendants	47	50	54	56	3	7	9	7	14	19
Refuse collectors	126	120	126	135	-6	0	10	-5	0	8
Service station attendants	308	307	331	348	-1	23	40	0	7	13
Vehicle washers and equipment cleaners	215	214	230	242	-1	15	27	-1	7	13

Implications of the projections

The differential growth of occupations has a variety of implications for the job market expected through the 1990's, especially for the characteristics of workers who will have the best opportunities and those who are likely to have the most difficulty in obtaining good jobs. The following sections discuss the likely conse-

quences of declining occupations, the need for education and training, and the implications of the projections for job opportunities for members of minority groups.

Declining occupations and worker displacement. The Bureau projects many industries to decline in employment between 1988 and 2000. Workers employed in occupations that are concentrated in these industries are potentially subject to displacement. However, such workers may have more favorable reemployment prospects if employment gains in their occupation in growing industries are greater than losses in declining ones. Workers in occupations that are expected to decline in growing industries as well as in declining ones, generally because of the impact of widespread technological change, also are subject to potential displacement.

The analysis presented here deals only with potential job losses implied by the Bureau's 1988-2000 employment projections. It does not attempt to identify workers who may lose their jobs because of business failure in a growing industry, such as eating and drinking places. Such workers generally have favorable prospects for reemployment in the same occupation and geographic area, although many no doubt suffer periods of unemployment.³ It should be noted also that not all workers in declining occupations whose jobs are eliminated become displaced. Their employers may place them in similar occupations or provide training for other jobs. Finally, the analysis does not attempt to account for the effects of business cycles on worker displacement.

The data analyzed relate only to wage and salary workers and exclude self-employed and unpaid family workers. The 258 detailed industry-occupation matrixes were divided into two groups—industries that are projected to grow and those that are projected to decline. Within each group, estimates of employment change for individual occupations were developed. The combined total for declining and growing industries reflects 1988-2000 employment change for the economy as a whole.

Table 7 shows the 1988-2000 employment change, by occupation, for all occupations with a projected decline of 10,000 workers or more in declining industries. Data are presented on employment change in all industries, in all industries that are projected to decline, and in all industries projected to show employment growth. The occupations are ranked by the absolute employment decline in the declining industries. The table indicates whether there might be favorable reemployment opportunities

Table 5. Fastest growing occupations, 1988-2000, moderate alternative projection

[Numbers in thousands]

Occupation	Employment		Numerical change	Percent change
	1988	2000		
Paralegals	83	145	62	75.3
Medical assistants	149	253	104	70.0
Home health aides	236	397	160	67.9
Radiologic technologists and technicians	132	218	87	66.0
Data processing equipment repairers	71	115	44	61.2
Medical records technicians	47	75	28	59.9
Medical secretaries	207	327	120	58.0
Physical therapists	68	107	39	57.0
Surgical technologists	35	55	20	56.4
Operations research analysts	55	85	30	55.4
Securities and financial services sales workers	200	309	109	54.8
Travel agents	142	219	77	54.1
Computer systems analysts	403	617	214	53.3
Physical and corrective therapy assistants	39	60	21	52.5
Social welfare service aides	91	138	47	51.5
Occupational therapists	33	48	16	48.8
Computer programmers	519	769	250	48.1
Human services workers	118	171	53	44.9
Respiratory therapists	56	79	23	41.3
Correction officers and jailers	186	262	76	40.8

Table 6. Occupations with the largest job growth, 1988-2000, moderate alternative projection

[Numbers in thousands]

Occupation	Employment		Numerical change	Percent change
	1988	2000		
Salespersons, retail	3,834	4,564	730	19.0
Registered nurses	1,577	2,190	613	38.8
Janitors and cleaners, including maids and housekeeping cleaners	2,895	3,450	556	19.2
Waiters and waitresses	1,786	2,337	551	30.9
General managers and top executives	3,030	3,509	479	15.8
General office clerks	2,519	2,974	455	18.1
Secretaries, except legal and medical	2,903	3,288	385	13.2
Nursing aides, orderlies, and attendants	1,184	1,562	378	31.9
Truck drivers, light and heavy	2,399	2,768	369	15.4
Receptionists and information clerks	833	1,164	331	39.8
Cashiers	2,310	2,614	304	13.2
Guards	795	1,050	256	32.2
Computer programmers	519	769	250	48.1
Food counter, fountain, and related	1,626	1,866	240	14.7
Food preparation workers	1,027	1,260	234	22.8
Licensed practical nurses	626	855	229	36.6
Teachers, secondary school	1,164	1,388	224	19.2
Computer systems analysts	403	617	214	53.3
Accountants and auditors	963	1,174	211	22.0
Teachers, kindergarten and elementary	1,359	1,567	208	15.3

for workers in specific occupations in growing industries if they were to lose their jobs in declining industries. For example, the occupation with the largest change in the declining industries is all other assemblers and fabricators (-113,100 jobs), an occupation heavily concentrated in manufacturing.⁴ Numbers of workers in this occupation also are projected to decline in the growing industries (-3,300 jobs). Therefore, reemployment prospects in the same occupation for such workers who lose their jobs are very poor.

The picture is somewhat different for the occupation secretaries, excluding medical and legal, which is projected to lose 44,000 jobs in the declining industries. These workers are not concentrated by industry and employment is projected to increase significantly in the growing industries (428,000 jobs). The net increase in all industries is 384,000 jobs, which translates into relatively favorable reemployment prospects for secretaries if they were to lose their jobs in declining industries. Other occupations with projected large job losses in the declining industries, but which will have even greater job gains in growing industries, include all other helpers, laborers, and material movers, hand; freight, stock, and material movers, hand; blue-collar worker supervisors; bookkeeping, accounting, and auditing clerks; general office clerks; janitors and cleaners; general managers and top executives; sheet metal workers and duct installers; and gardeners and groundskeepers, except farm.

Workers in most of the remaining occupations shown in table 7 face unfavorable reemployment prospects in the same occupation if they lose their jobs, because the occupation is concentrated in industries projected to decline or because the occupation is expected to decline in virtually all industries due to technological change or other factors. For example, jobs for industrial truck and tractor operators are expected to be affected by the continuing spread of automated materials handling equipment in factories and warehouses. Increased use of improved or automated inspecting equipment by workers is expected to reduce the overall demand for inspectors, testers, and graders, precision, by the year 2000. The occupations electrical and electronic assemblers; electrical and electronic equipment assemblers, precision; welders and cutters; and welding machine setters, operators, and tenders are all projected to decline due to the wider adoption of industrial robots and other automated processes. Typists and word processors are expected to decline overall because of the increasing use of word processing equipment. Numbers of hand pack-

ers and packagers are expected to decline as a result of greater use of improved tools and equipment. And opportunities for machine feeders and offbearers are projected to shrink due to greater use of improved machinery and equipment that automatically load and unload products.

Displaced workers who face perhaps the most

Table 7. Projected employment change by occupation, 1988-2000, ranked by absolute change in declining industries

[Numbers in thousands]

Occupation	Projected 1988-2000 employment change		
	All Industries	All declining industries	All growing industries
Total, all occupations	17,120.1	- 1,435.3	18,555.4
All other assemblers and fabricators	- 116.4	- 113.1	- 3.3
Farm workers	- 98.2	- 108.5	10.2
Sewing machine operators, garment	- 90.7	- 96.1	5.4
Inspectors, testers, and graders, precision	- 41.7	- 71.6	29.9
Electrical and electronic assemblers	- 103.3	- 69.0	- 34.3
All other helpers, laborers, and material movers, hand	70.2	- 57.9	128.1
Blue-collar worker supervisors	124.1	- 54.6	178.7
Hand packers and packagers	- 75.0	- 48.8	- 26.2
Secretaries, except legal and medical	383.9	- 44.1	428.0
Electrical and electronic equipment assemblers, precision	- 70.2	- 44.1	- 26.1
Freight, stock, and material movers, hand	19.7	- 37.6	57.3
All other machine operators, tenders, setters, and set-up operators	- 28.5	- 34.1	5.6
Textile draw-out and winding machine operators and tenders	- 30.2	- 30.8	6
Packaging and filling machine operators and tenders	- 32.6	- 30.1	- 2.5
Child care workers, private household	- 28.1	- 28.1	0
Industrial truck and tractor operators	- 21.4	- 27.6	6.3
Machine feeders and offbearers	- 31.0	- 26.0	- 5.0
Welders and cutters	- 16.1	- 24.8	8.7
Bookkeeping, accounting, and auditing clerks	40.3	- 24.4	64.7
Machine forming operators and tenders, metal and plastic	- 18.4	- 23.4	5.0
General managers and top executives	478.9	- 22.5	501.4
All other hand workers	- 18.5	- 19.6	1.1
All other mechanics, installers, and repairers	- 25.9	- 17.7	- 8.3
Gardeners and groundskeepers, except farm	149.4	- 17.5	166.9
Janitors and cleaners, including maids and housekeeping cleaners	471.8	- 16.8	488.6
Crushing and mixing machine operators and tenders	- 18.9	- 15.8	- 3.1
Sewing machine operators, nongarment	- 8.0	- 15.3	7.2
Machine tool cutting operators and tenders, metal and plastic	- 14.9	- 14.1	- 8
Typists and word processors	- 66.2	- 13.3	- 52.9
Welding machine setters, operators, and tenders	- 13.6	- 13.0	- 6
Cleaners and servants, private household	- 12.6	- 12.6	0
All other metal and plastic machine setters, operators, and related workers	- 11.5	- 11.9	3
General office clerks	454.3	- 11.1	465.4
All other machine tool cutting and forming, etc.	- 4.3	- 10.9	6.5
Chemical equipment controllers, operators, and tenders	- 10.8	- 10.2	- 6
Sheet metal workers and duct installers	9.7	- 10.1	19.8

Outlook 2000: Occupational Employment

unfavorable reemployment prospects in the same occupation are those in occupations that are highly concentrated in a very few declining industries. For example, the apparel industry, which is projected to have a large employment decline (-172,000 jobs), employs more than 80 percent of sewing machine operators, garment, and almost 50 percent of sewing machine operators, nongarment. Total employment for these two occupations is expected to decline by 91,000 and 8,000, respectively. Employment of textile draw-out and winding machine operators and tenders is heavily concentrated in the textile mill products industry, which is projected to lose about 103,000 jobs from 1988 to 2000. Consequently, the number of workers in this

occupation is expected to decline by 30,000. Workers in this occupation are expected to suffer from the displacement effects of increased automation as well.

It should be emphasized that projected employment declines may not lead to displacement of all workers in the occupations discussed here, because some workers may be provided other jobs by their employers. Workers in occupations that are concentrated in declining industries that are themselves concentrated geographically are most likely to face displacement. However, there are relatively few occupations that fall into this category, as only a few of the industries projected to decline are concentrated in a few States.

Table 8. Projected percent change in employment for selected occupations, 1988-2000, and percent distribution of total employment by years of school completed, March 1988

Occupation	Percent change, 1988-2000	Percent of total employment for occupation held by workers with—				Occupation	Percent change, 1988-2000	Percent of total employment for occupation held by workers with—			
		Less than high school	High school	1-3 years of college	4 or more years of college			Less than high school	High school	1-3 years of college	4 or more years of college
Total, all occupations	15	16	40	21	23	Secretaries, typists and stenographers	10	4	54	33	10
Executive, administrative, and managerial occupations	22	5	27	24	44	Financial recordkeeping	1	5	54	28	13
Professional specialty occupations	24	2	9	15	74	Mail clerks and messengers	10	10	48	28	14
Engineers	25	1	10	14	75	Other clerical occupations	13	9	51	28	12
Computer, mathematical, and operations research analysts	52	0	12	24	64	Service occupations	23	31	45	18	6
Natural scientists	19	2	4	6	88	Private household workers	-5	50	34	12	4
Health diagnosing occupations	24	2	3	2	93	Protective service occupations	23	12	43	29	16
Health assessment occupations	38	2	8	35	56	Food preparation and service occupations	23	37	42	17	4
Teachers, college	3	0	4	10	86	Health service occupations	34	23	51	22	5
Teachers, except college	18	1	7	8	84	Cleaning and building service occupations, except private household	20	41	46	10	3
Lawyers and judges	30	1	3	2	95	Personal service occupations	27	19	53	22	7
Other professional workers	23	3	16	19	62	Precision production, craft, and repair occupations	10	23	53	18	5
Technicians and related support occupations	32	3	29	36	32	Mechanics, installers, and repairers	13	21	55	19	4
Health technicians and technologists	34	3	35	40	22	Construction trades	16	25	53	17	5
Engineering and science technicians and technologists	20	4	35	39	22	Other precision production occupations	3	23	52	18	8
Technicians, except health, engineering, and science	39	1	18	27	54	Operatives, fabricators, and laborers	1	33	51	12	4
Marketing and sales occupations	20	13	39	24	23	Machine operators, assemblers	-3	34	52	11	4
Administrative support occupations, including clerical	12	7	51	30	12	Transportation and material moving machinery and vehicle operators	12	29	53	14	5
Clerical supervisors and managers	12	4	45	26	24	Helpers, laborers, and material movers, hand	2	37	47	13	3
Computer operators and peripheral equipment operators	29	5	46	33	16	Agriculture, forestry, fishing, and related occupations	-5	36	44	12	7

Educational requirements. An analysis of the 1988–2000 occupational employment projections indicates that, in general, employment is projected to increase faster in occupational groups requiring the most education than in those requiring less education. Executive, administrative, and managerial occupations, professional specialty occupations, and technicians and related support occupations have the smallest proportions of workers with less than a high school education and the highest proportions completing at least 4 years of college, and are projected to grow more rapidly than average. (See table 8.) There are some exceptions to this general pattern, however. Service workers, a major group having relatively few workers with a college degree and a high proportion with less than a high school education, is projected to grow faster than average. Also, among the professional specialty occupations, numbers of college and university faculty are projected to grow slowly (3 percent) because college enrollments are not expected to increase between 1988 and 2000. Within the slower-than-average growing major occupational groups shown in table 8, only computer operators and peripheral equipment operators will increase more rapidly than average.

In spite of projected growth rates that are higher for the best educated workers and lower for the least educated workers, the structure of employment at the major occupational group level is not expected to change substantially from 1988 to 2000. (See table 1.) The ranking of occupations by employment size in 2000 should be similar to that in 1988. For example, the administrative support occupations category is expected to continue to have the largest number of workers, followed by service occupations. Professional specialty occupations, however, is expected to move up from the fourth to the third largest group, ahead of operators, fabricators, and laborers. All other major occupational groups should maintain the rank they had in 1988.

The projections show the structure of employment by major occupational group changing only slowly over time. Most of the major groups are projected to change their share of total employment by less than 1 percentage point from 1988 to 2000. The only exception is the major group operators, fabricators, and laborers, which is expected to decline by 1.8 percentage points.

The stability of the overall occupational structure over the 1988–2000 period implies that workers will continue to be required across a broad spectrum of educational requirements. Jobs will be available in 2000 for the less edu-

Table 9. Median annual earnings by occupation and level of education, 1987

Occupation	Total, all levels	Less than high school	High school	1–3 years college	4 years college or more
Total, all occupations	\$21,543	\$15,249	\$18,902	\$21,975	\$31,029
Executive, administrative, and managerial occupations	30,264	22,306	23,286	27,255	37,252
Professional specialty occupations	30,116	19,177	23,233	27,458	31,311
Technicians and related support occupations	24,489	16,207	21,358	23,830	28,004
Marketing and sales occupations	22,220	13,746	17,654	22,546	32,747
Administrative support occupations including clerical	17,120	15,535	16,554	17,491	20,823
Service occupations	13,443	10,764	13,093	16,937	21,381
Precision production, craft, and repair occupations	24,856	20,465	25,140	27,042	30,938
Operators, fabricators, and laborers	18,132	15,365	19,303	21,627	22,114
Agriculture, forestry, fishing, and related workers	11,781	10,571	12,730	16,331	17,130

Table 10. Percent distribution of employed persons, by years of school completed, race, and Hispanic origin, March 1988

Years of school	Total	Whites	Blacks	Hispanics
Total	100.0	100.0	100.0	100.0
Less than high school	16.4	15.8	22.7	39.0
High school	39.7	39.8	42.4	33.5
1–3 years of college	20.5	20.5	20.5	15.9
4 years of college or more	23.4	23.9	14.3	11.5

cated as well as for those who earn college degrees. Among each of the major occupational groups, however, those workers with 4-year college degrees earn more on average than workers without such degrees. (See table 9.) Furthermore, within each occupational group, workers with more education are expected to earn more than those workers with less education.

Despite this overall pattern, the inference should not be made that good jobs will be available in 2000 only for people with college degrees and only in those fields that are projected to grow faster than average. Many detailed occupations that do not require a 4-year college degree have above-average earnings and are expected to offer favorable employment prospects through 2000 due to projected growth rates that are at least average and to have many job openings as workers who leave the labor force or transfer to other occupations are replaced. Several of these occupations are found in the construction trades, including bricklayers and stonemasons; electricians; plumbers, pipefitters, and steamfitters; and structural and reinforcing metal workers. Other skilled occupations with

favorable employment opportunities are mechanics, installers, and repairers, including data processing equipment repairers; electronic repairers, commercial and industrial equipment; industrial machinery mechanics; heating, air conditioning, and refrigeration mechanics and installers; and mobile heavy equipment mechanics.

Although nearly half of all workers in marketing and sales occupations have some college training, most jobs do not require a 4-year college degree. Among those that are expected to have very favorable employment prospects through 2000, and that currently have above-average earnings, are insurance sales workers; travel agents; and sales agents, real estate. Occupations in other fields that are expected to be equally promising include paralegals; airplane pilots and flight engineers; flight attendants; reservation and transportation ticket agents and travel clerks; lithography and photoengraving workers, precision; and operating engineers.

While favorable employment opportunities in 2000 are expected in a wide variety of occupational fields, some groups of workers will have less of a competitive advantage than others in obtaining the best paying jobs due to a lack of education, training, or necessary job skills. Workers with the highest levels of educational attainment are likely to continue to have a competitive advantage over workers with less education, and they should continue to have more options in the job market. Access to higher paying jobs is likely to be particularly restricted for those with less than a high school education.

Minority groups. The educational attainment of blacks and Hispanics is lower than for whites. (See table 10.) It is not surprising, therefore, that blacks and Hispanics generally comprise a disproportionately large share of employment in occupations that require the least amount of education and training. As indicated above, these

Table 11. Percent change in employment for selected occupations 1988–2000, and percent of employment comprised by whites, blacks, and Hispanics, 1988

Occupation	Percent change, 1988–2000	Percent comprised by—			Occupation	Percent change, 1988–2000	Percent comprised by—		
		Whites	Blacks	Hispanics			Whites	Blacks	Hispanics
Total, all occupations	15	87	10	7	Secretaries, typists, and stenographers	10	85	8	5
Executive, administrative, and managerial occupations	22	92	6	4	Financial recordkeeping occupations	1	90	6	5
Professional specialty occupations	24	89	7	3	Mail clerks and messengers	10	74	22	9
Engineers	25	90	4	3	Other clerical occupations	13	84	13	7
Computer, mathematical, and operations research analysts	52	86	7	3	Service occupations	23	73	18	10
Natural scientists	19	90	3	3	Private household workers	- 5	76	23	17
Health diagnosing occupations	24	88	3	4	Protective service occupations	23	81	17	6
Health assessment occupations	38	87	8	3	Food service occupations	23	83	12	10
Teachers, college	3	89	4	4	Health service occupations	34	69	28	6
Teachers, except college	18	89	9	4	Cleaning service occupations	20	74	23	15
Lawyers and judges	30	96	2	2	Personal service occupations	27	85	12	8
Other professional workers	23	90	8	4	Precision production, craft, and repair occupations	10	90	8	8
Technicians and related support occupations	32	86	9	4	Mechanics, installers, and repairers	13	91	7	8
Health technicians and technologists	34	81	14	4	Construction trades	16	94	7	8
Engineering and scientific technicians	22	89	7	5	Other precision production occupations	3	88	8	9
All other technicians	39	88	7	4	Operatives, fabricators, and laborers	1	82	15	11
Marketing and sales occupations	20	91	6	5	Machine setters, set-up operators, operators, and tenders	- 3	83	15	7
Administrative support occupations, including clerical	12	86	11	6	Transportation and material moving machine and vehicle operators	12	82	16	11
Clerical supervisors and managers	12	85	14	6	Helpers, laborers, and material movers, hand	2	82	15	13
Computer operators and peripheral equipment operators	29	83	14	6	Agriculture, forestry, fishing, and related workers	- 5	92	7	13

NOTE: Hispanics can be of any race.

Table 12. Percent distribution of employment by occupation, 1988 and projected 2000 alternatives

Occupation	1988	2000		
		Low	Moderate	High
Total employment	100.0	100.0	100.0	100.0
Executive, administrative, and managerial occupations	10.2	10.8	10.8	10.9
Professional specialty occupations	12.4	13.4	13.3	13.2
Technicians and related support occupations	3.3	3.7	3.7	3.7
Marketing and sales occupations	11.3	11.6	11.7	11.6
Administrative support occupations, including clerical	17.8	17.4	17.3	17.3
Service occupations	15.6	16.7	16.6	16.4
Agriculture, forestry, fishing, and related occupations	3.0	2.4	2.4	2.5
Precision production, craft, and repair occupations	12.0	11.4	11.4	11.6
Operators, fabricators, and laborers	14.4	12.5	12.6	12.8

are generally the occupational groups projected to grow most slowly through 2000 and to have relatively low average earnings. (See table 11.) More than half of all employed blacks and Hispanics in 1988 were found in three major occupational groups—service occupations; administrative support occupations, including clerical; and operators, fabricators, and laborers. All three groups had below-average annual earnings in 1988. Additionally, two of these three major occupational groups—administrative support occupations, including clerical, and operators, fabricators, and laborers—have below-average projected employment growth from 1988 to 2000. Only the service occupations group is projected to grow faster than average through 2000.

In summary, employment opportunities will be found across the entire spectrum of occupations in our economy. However, workers having the most education and training are in a better position to obtain jobs that, on average, are higher paying. Blacks and Hispanics, who traditionally have had lower educational attainment than whites, are likely to continue to be at a disadvantage in the job market unless their educational attainment improves.

Low and high projections

The distribution of employment by broad occupational group varies little among the projected alternatives for 2000 because of offsetting changes within the broad occupational groups. (See table 12.) Within specific occupations, however, some significant differences exist between the moderate and the low or high alternatives. The differences in occupational em-

ployment from one alternative to another are caused only by differences in projected industry employment levels, because the same set of occupational staffing patterns was used for all alternatives. Total employment in the moderate-trend projections varies by only about 6 percent from the high alternative and about 7 percent from the low alternative. Therefore, the greatest numerical differences for specific occupations exist between the low alternative projected employment and the moderate-trend employment, as shown below:

Occupation	Employment difference
Salespersons, retail	339,000
General managers and top executives	239,000
Janitors and cleaners	210,000
Secretaries, except legal and medical	204,000
Truck drivers, light and heavy	197,000
General office clerks	187,000
Cashiers	185,000
Bookkeeping, accounting, and auditing clerks	153,000
Waiters and waitresses	149,000
Blue-collar worker supervisors	142,000

Uses of occupational projections

The occupational projections presented in this article provide information for analyzing a variety of labor market issues and provide the background for analyses of future employment opportunities described in the BLS *Occupational Outlook Handbook*. Job outlook discussions in the 1990-91 edition of the *Handbook*, scheduled for release in the Spring of 1990, will use the projections presented in each of the articles that make up *Outlook 2000*. □

Footnotes

¹ The 1988 matrix presents the occupational structure of 258 detailed industries. These data cover wage and salary workers only. The data on the occupational structure of most industries were derived from the Bureau's Occupational Employment Statistics Survey. Data for agriculture; forestry; fishing, hunting, and trapping; and private households were derived from the Current Population Survey (CPS). Estimates of self-employed and unpaid family workers were derived from the CPS.

² The services industry division in the industry-occupation matrix includes State and local government hospitals and education. In the article on industry employment by Valerie Personick presented on pages 17-23, workers in State and local government hospitals and education are included in estimates of government employment.

³ See *Displaced Workers, 1981-85*, Bulletin 2289 (Bureau of Labor Statistics, September 1987).

⁴ Because there are so few occupations that are affected significantly by the declining industries, this analysis will incorporate residual occupations not shown in table 4.