

Projections 2000

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The primary methodological change in this set of projections involved the development of projections for five-year-age groups for blacks. Participation rates were also calculated for the Asian and other labor force, but after examination of the historical data, there was so much year-to-year variation that the growth patterns in labor force participation of whites were used instead to project the Asian and other labor force.

Labor force participation rates for women of prime working age (25 to 54) and older ages were assumed not to exceed that of men. After examination of the preliminary employment projections, the assumed participation rate of young whites was adjusted upward to reflect anticipated growth in job opportunities for first-time jobseekers and the declining number of youth available for those jobs.

Compositional changes in the labor force

Age. By 2000, prime working-age persons would make up 73 percent of the labor force, up from 67 percent in 1986 (table 1). This reflects underlying demographic changes; the baby-boom generation will still be in the prime working ages, but between 1995 and 2000, the "echo" of the baby boom (their children) are projected to begin entering the labor force. Despite this, the youth in the labor force are still projected to account for a smaller share of the labor force in 2000 than in 1986, 16 percent, compared with 20 percent—although their share is expected to be even lower in 1995. The share of older workers (55 and older) also is projected to shrink between 1986 and 2000 by about $1\frac{1}{2}$ percentage points. The share of workers 55 and older is projected to be slightly lower in 1995, because that is when the group known as the "birth dearth of the 1930's" enters the retirement years. The following tabulation shows the number, in millions, of persons in each major age group for 1972–86 and the rate of growth for 1986–2000.

Period:	Youth	Prime working age	Older
1972	20.2	52.3	14.5
1986	23.4	79.6	14.9
2000	22.6	100.8	15.4
Growth rate:			
1972–86	1.1	3.0	.2
1986–2000	-.2	1.7	.2

The labor force group age 55 and older is projected to decrease between 1986 and 1995, but then increase between 1995 and 2000. During the latter period, this group would be the fastest growing component of the labor force. The youth labor force, which has been decreasing since 1980, is also projected to decline until 1995, before increasing more rapidly than the overall labor force. The prime working-age group is the only one that is projected to grow throughout the period, even though some age groups within this broader age group are expected to decline for at least part of the 1986–2000 period. The prime age work force grew by 3

percent annually between 1980 and 1986; this growth rate is projected to drop to 2.6 percent for the rest of this decade, 1.8 percent for the early 1990's, and less than 1 percent yearly until 2000.

The changes in such broad age groups are a reflection of the changing size of underlying finer age groups, which are, in turn, a reflection of past variability in births. To further explicate the process, we describe the changes in various detailed age groups.

After the baby boom (defined by the Census Bureau as starting in 1946 and ending in 1964), the number of births dropped until 1975, with a modest upswing in 1968–70. Since 1976, births have increased as the women of the baby boom became mothers, the "echo" to the baby boom. As a result of the drop in births that started in 1960, the number of 16-year-olds in the population and labor force began to decline about 1976 and is expected to continue to decline until 1992. (There was a short-lived "boomlet" between 1968 and 1970, resulting in an increase in the number of teenagers during 1986–88.) The number of 17-year-olds began to decline in 1977, 1 year after the number of 16-year-olds. The decline should end 1 year later than for 16-year-olds, or 1993. Looking at larger age groups which are less sensitive to yearly variations in births, we see that the number of 16- to 19-year-olds began dropping in the late 1970's and is projected to continue to do so until the mid-1990's. Thereafter, this age group is projected to increase as the larger number born after 1978—the echo to the baby boom—begins to enter the labor force. The teenage labor force is projected to drop by nearly 1.5 million between 1986 and 1992 and then to increase by 1.4 million between 1992 and 2000.

This effect—reversal in direction over the 1986 and 2000 period—also is projected to prevail for other age groups. Numbers of labor force participants 20 to 24 years of age began to drop in the early 1980's and are projected to decline by 2.4 million people between 1986 and 1997 before beginning to increase. The labor force ages 25 to 29, which has been growing rapidly, is projected to decline from the late 1980's until after 2000. The drop would be 2.9 million between 1986 and 2000. For those in the labor force who are 30 to 34 years old, the projected decline begins in the early 1990's. In the late 1990's, the next older group, ages 35 to 39 starts its decline in absolute numbers. The 30-to-34-year-olds are projected to increase by 2.1 million through the early 1990's and then decline by 2.2 million by 2000. The 35 to 39 group is projected to increase by 4.2 million between 1986 and the mid-1990's and then to decline only slightly by the year 2000.

Race or ethnicity. ~~Blacks are projected to account for 18 percent of labor force growth between now and the end of the century.~~ This would be significantly above their current share of the overall labor force. Blacks made up 11 percent of labor force growth between 1972 and 1979, 16 percent

Table 3. Civilian noninstitutional population, by sex, age, race, and Hispanic origin, actual 1972, 1979, and 1986, and projected to 2000

Group	Level (in thousands)				Change (in thousands)			Growth rate		
	1972	1979	1986	Projected, 2000	1972-79	1979-86	1986-2000	1972-79	1979-86	1986-2000
Total, 16 and over	144,122	164,865	180,589	204,699	20,743	15,723	24,110	1.9	1.3	0.9
Men, 16 and over	67,835	78,021	85,799	97,962	10,186	7,778	12,163	2.0	1.4	1.0
16 to 24	15,768	18,184	16,773	15,489	2,416	-1,411	-1,284	2.1	-1.1	- .6
25 to 54	34,840	40,184	47,343	57,250	5,344	7,159	9,907	2.1	2.4	1.4
55 and over	17,227	19,653	21,683	25,223	2,426	2,030	3,540	1.9	1.4	1.1
Women, 16 and over	76,287	86,844	94,790	106,737	10,557	7,946	11,947	1.9	1.3	.9
16 to 24	16,887	18,827	17,293	15,999	1,940	-1,534	-1,294	1.6	-1.2	- .6
25 to 54	37,595	42,692	49,672	59,094	5,097	6,980	9,422	1.8	2.2	1.2
55 and over	21,805	25,325	27,825	31,644	3,520	2,500	3,819	2.2	1.4	.9
White, 16 and over	127,904	143,898	155,433	171,230	15,994	11,535	15,797	1.7	1.1	.7
Black, 16 and over	14,543	17,366	19,989	24,750	2,823	2,623	4,761	2.6	2.0	1.5
Asian and other, ¹ 16 and over	-	3,601	5,164	8,719	-	1,562	3,555	-	5.3	3.8
Hispanic, ² 16 and over	-	8,208	12,343	20,490	-	4,135	8,147	-	6.0	3.7

¹ The "Asian and other" group includes American Indians, Alaskan Natives, Asians, and Pacific islanders. The historic data are derived by subtracting "Black" from the "Black and other" group; projections are made directly.

² Persons of Hispanic origin may be of any race. Data for Hispanics are not available before

1976.

NOTE: Dash indicates data not available.

SOURCE: Based on U.S. Bureau of Census "middle" population projections.

between 1980 and 1986, and are projected to account for 17 percent between 1986 and 1990. The following tabulation shows the number, in millions, of persons in the labor force and the growth rate, in percent, by race or ethnic origin, 1972-86 and 1986-2000:

Group	Labor force			Growth rate	
	1972	1986	2000	1972-86	1986-2000
Total	87.0	117.8	138.8	2.2	1.2
White	77.3	101.8	116.7	2.0	1.0
Black	8.7	12.7	16.3	2.7	1.8
Asian and other	-	3.4	5.7	-	3.9
Hispanic	-	8.1	14.1	-	4.1

There are projected to be 16.3 million blacks in the labor force in 2000, up 3.7 million from 1986. This represents a higher annual growth rate, 1.8 percent, than those projected for whites and for the overall labor force. Black labor force participation is projected to grow 0.3 percent annually, as is that of whites. By 2000, blacks are projected to account for 12 percent of the labor force, up 1 percentage point from 1986.

The white labor force is projected to grow by 15 million between 1986 and 2000, reaching a level of 117 million. Whites have historically been the largest share of the labor force, but this share has been dropping and is projected to continue to do so—in 1972 it was 89 percent and by 2000, it should be 84 percent. Thus, the white labor force, which also includes nearly all of the Hispanics, is growing more slowly than the overall labor force, 0.2 percent per year less over both the historical period, 1972-86, and the projected period, 1986-2000. This slower growth reflects slower population increases (table 2), because labor force participation of whites is projected to grow at the same rate as the overall labor force.

The Asian and other labor force is projected to increase 71 percent, or by 2.4 million persons, between 1986 and 2000. This increase reflects a high rate of population growth, which, in turn, reflects higher births and immigration of this group. By 2000, persons of Asian and other races would constitute 4 percent of the labor force, up from less than 3 percent in 1986. Over the 1986-2000 period, Asians and others account for 11 percent of the projected growth in the labor force. This represents a slowing in their growth rate from the 1979-86 period during which their population was increasing rapidly due to the entry of refugees. This entry of refugees has virtually stopped, and it is assumed not to occur again over the projection period.

Labor force participation of the Asian and other group is assumed to increase at the same rate as whites at the individual age-sex level. Their participation rate is projected to be lower than that of whites in 2000. This reflects their lower participation in 1986. The lower rate of increase for their overall labor force participation reflects the different age and sex composition of this population group.

The Hispanic labor force is projected to increase 74 percent between 1986 and 2000; among the largest increases projected for any group. By 2000, Hispanics are projected to be 10 percent of the labor force, up from 7 percent in 1986. This increase results in 6 million more Hispanics entering the labor force, for a total of 14 million in 2000.

Hispanic labor force participation, which increased 0.4 percent annually between 1979 and 1986, is projected to continue to increase at that rate over the next 14 years. This reflects the younger age of the Hispanic population—with more young women, overall participation rises as their participation is projected to rise. By contrast, whites and blacks are projected to have slower rates of increase in participation.

The greater use of automated materials handling equipment in factories and warehouses is projected to cause employment in the industrial truck and tractor operators occupation to decrease by about 34 percent. Employment in the truck drivers occupation, however, is projected to grow by 21 percent, increasing by more than half a million jobs between 1986 and 2000. Other occupations expected to have average growth rates include bus drivers, parking lot attendants, excavation and loading machine operators, grading machine operators, and operating engineers. The aircraft pilots and flight engineers occupation is projected to increase faster than the average for total employment, or by 29 percent.

Helpers, laborers, and hand material movers. Occupations in this group are generally expected to grow more slowly than the average for total employment except for the refuse collectors occupation, which is projected to have an average rate of growth through the year 2000. Declines in the machine feeders and offbearers occupation (6 percent) and freight, stock, and material movers occupation (2 percent) are expected as a result of technological changes.

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 7.) In specific occupations, however, some significant differences may exist between the moderate and either the low or high alternatives. The differences in occupational employment from one alternative to another are caused only by differences in projected industry employment levels, because the same set of occupational staffing

Table 7. Occupational employment distribution, 1986 and projected to 2000

Occupation	1986	Projected, 2000		
		Low	Moderate	High
Total, all occupations	100.0	100.0	100.0	100.0
Managerial and management-related workers	9.5	10.2	10.2	10.3
Engineers, architects, and surveyors	1.4	1.6	1.6	1.6
Natural scientists and computer specialists	0.7	0.8	0.8	0.8
Teachers, librarians, and counselors	4.4	4.4	4.3	4.3
Health-diagnosing and treating specialists	2.3	2.8	2.8	2.8
Other professional specialists	3.3	3.5	3.5	3.5
Technicians	3.3	3.8	3.8	3.8
Marketing and salesworkers	11.3	12.3	12.3	12.2
Administrative support, including clerical	17.8	16.6	16.6	16.6
Service workers	15.7	17.3	17.2	17.1
Agriculture, forestry, and fishing workers	3.2	2.6	2.6	2.5
Blue-collar worker supervisors	1.6	1.5	1.5	1.5
Construction trades and extractive workers	3.6	3.6	3.5	3.6
Mechanics and repairers	4.2	4.0	4.0	4.0
Precision production and plant systems occupations	2.7	2.4	2.4	2.4
Machine setters and operators	4.4	3.5	3.6	3.6
Assemblers and other hand workers	2.4	1.9	1.9	2.0
Transportation and material moving workers	4.3	4.0	4.0	4.0
Helpers and laborers	3.8	3.4	3.4	3.4

patterns were used for all alternatives. Total employment in the moderate trend projections varies by only about 4 percent from the high alternative and about 6 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; the following text tabulation shows these differences:

Occupation	Employment difference
Salespersons, retail	216,000
Secretaries	188,000
General managers and top executives	145,000
Truck drivers, light and heavy	138,000
Janitors and cleaners	136,000
General office clerks	136,000
Cashiers	125,000
Bookkeeping, accounting, and auditing clerks	123,000
Blue-collar worker supervisors	113,000
Waiters and waitresses	94,000

Uses and implications

BLS occupational projections are used extensively for career guidance and provide the background for analyses of future employment opportunities in the BLS *Occupational Outlook Handbook*. Job outlook discussions in the 1988-89 edition of the *Handbook*, scheduled for release in the spring of 1988, will use the projections presented in this article. These projections also provide information for analyzing a variety of issues, including the relation of education and training to job opportunities and labor market conditions for minority groups.

Educational attainment. Much has been written to indicate that the changing occupational structure of employment

Table 6. Fastest declining occupations, 1986-2000, moderate alternative
[Numbers in thousands]

Occupation	Employment		Percent decline in employment
	1986	Projected, 2000	
Electrical and electronic assemblers	299	116	-53.7
Electronic semiconductor processors	29	14	-51.1
Railroad conductors and yardmasters	29	17	-40.9
Railroad brake, signal, and switch operators	42	25	-39.9
Gas and petroleum plant and system occupations	31	20	-34.3
Industrial truck and tractor operators	426	283	-33.6
Shoe sewing machine operators and tenders	27	18	-32.1
Station installers and repairers, telephone	58	40	-31.8
Chemical equipment controllers, operators and tenders	73	52	-29.7
Chemical plant and system operators	33	23	-29.6
Stenographers	178	128	-28.2
Farmers	1,182	850	-28.1
Statistical clerks	71	52	-26.4
Textile draw-out and winding machine operators and tenders	219	164	-25.2
Central office and pex installers and repairers	74	57	-23.1
Farm workers	940	750	-20.3
Coil winders, tapers, and finishers	34	28	-18.5
Central office operators	42	34	-17.9
Directory assistance operators	32	27	-17.7
Compositors, typesetters, and arrangers, precision	30	25	-17.1

implies the need for a more highly educated work force. If the 1986-2000 occupational projections substantiate this view, the occupational clusters discussed previously were divided into three groups. Group I includes the clusters in which at least two-thirds of the workers in 1986 had 1 or more years of college. Group II includes the clusters in which the median years of school completed was greater than 12 and the proportion of those workers with less than a high school education was relatively low. Group III includes occupational clusters where the proportion of workers having less than a high school education was relatively high—more than 30 percent. Given that workers in any occupational cluster have a broad range of educational background, these three groups can only be based on the educational level of the majority of workers. Obviously, workers are employed in each of the groups at each of the educational levels.

The distribution of total employment in 1986 and projected 2000 employment for these three groups of educational attainment is shown in table 8. These data indicate that employment in the occupations requiring the most education, group I, is projected to increase as a proportion of total employment, while employment in the other two groups in which workers had less education will decline as a proportion of total employment. The proportion of total employment is expected to decline the most in group III, the group which requires the least amount of education. It should be noted that the service workers group—the only occupational cluster in the educational attainment group III with median school years completed above 12 years—is increasing as a proportion of total employment. All other occupational clusters in this group are declining (some by very significant amounts). Conversely, in group I, all the

Table 8. Employment in broad occupational clusters by level of educational attainment, 1986 and projected to 2000, moderate alternative

(In percent)

Occupation	1986	2000
Total, all groups	100.0	100.0
Group I, total	25.1	27.3
Management and management-related occupations	9.5	10.2
Engineers, architects, and surveyors	1.4	1.5
Natural scientists and computer specialists	.7	.8
Teachers, librarians, and counselors	4.4	4.3
Health diagnosing and treating	2.3	2.8
Other professional specialists	3.5	3.7
Technicians	3.3	4.0
Group II, total	40.8	40.0
Salesworkers	11.3	12.3
Administrative support, including clerical	17.8	16.7
Blue-collar worker supervisors	1.6	1.5
Construction trades and extractive workers	3.4	3.3
Mechanics and repairers	4.2	4.0
Precision production and plant systems workers	2.5	2.2
Group III, total	34.0	32.7
Service workers	15.7	17.2
Agriculture, forestry, and fishing workers	3.3	2.6
Machine setters and operators	4.5	3.6
Hand workers	2.4	1.9
Transportation and material moving workers	4.3	4.0
Helpers and laborers	3.8	3.4

Table 9. Projected 1986-2000 growth rate and percent of total employment in 1986 accounted for by blacks, Hispanics, and women, moderate alternative¹

Occupation	Projected percent change, 1986-2000	Percent of total employment in 1986		
		Black	Hispanic	Women
Total, all occupations	19	10	7	44
Natural scientists and computer specialists	46	6	3	31
Health diagnosing and treating occupations	42	6	3	67
Technicians	38	8	4	47
Engineers, architects, and surveyors	32	4	3	7
Service workers	31	17	9	61
Marketing and salesworkers	30	6	5	48
Managerial and management-related workers	29	6	4	43
Other professional workers	26	7	4	43
Construction trades and extractive workers	18	7	8	2
Teachers, librarians, and counselors	16	9	3	68
Mechanics and repairers	15	7	7	3
Administrative, support, including clerical	11	11	6	80
Transportation and material moving workers	10	14	8	9
Helpers and laborers	6	17	11	16
Precision production and plant systems occupations	4	9	9	23
Machine setters and operators	-4	16	13	42
Assemblers and other handwork occupations	-4	13	11	38
Agriculture, forestry, and fishing workers	-5	7	10	16

¹ Does not include supervisors in construction trades and extractive workers; mechanics and repairers; precision production and plant system occupations; or assemblers and other handwork occupations.

clusters are increasing as a percent of total employment except for the teachers, librarians, and counselors occupation.

Minority groups. Job opportunities for individuals or groups of workers are determined by a multitude of factors relating to the job market and the characteristics of workers. Consequently, in developing projections of employment by industry and occupation, BLS does not develop projections of the demographic composition of those jobs. However, data on the current demographic composition of jobs can be used in conjunction with projected change in employment to determine the implications of the employment projections. For example, projections can be used to see if future job growth is consistent with the labor market pattern for jobs currently held by blacks and Hispanics.

Blacks and Hispanics accounted for about 10 percent and 7 percent of employment in 1986, respectively. Although members of these two groups were employed in virtually every occupation, they were more heavily concentrated in certain occupational clusters. These occupational clusters are listed in decreasing order by projected growth rate in table 9. In general, the data show that both blacks and Hispanics account for a greater proportion of persons employed in the occupations that are projected to decline or grow more slowly than in those occupations that are projected to increase rapidly. It should be pointed out that the occupational clusters projected to decline or grow slowly are generally those requiring the least amount of education and training and those projected to grow the fastest require the most education and training. The only exception is the service workers cluster, which, as discussed previously, is growing rapidly.

In general, occupations having the fastest growth rates can be assumed to have the better opportunities for employment. For blacks and Hispanics to improve their labor market situation, they must be able to take advantage of those opportunities. The labor force projections discussed in the article by Howard Fullerton, pp. 19-29, indicate that blacks and Hispanics will make up 17.4 percent and 28.7 percent of the total labor force growth, respectively. Because, as noted earlier, the fastest growing occupations are those in which a high percentage of workers currently have post-secondary education, the data imply that improvements in educational attainment are important if blacks and Hispanics are to take advantage of the favorable job opportunities associated with these rapidly growing occupations.

The proportion of women employed in certain occupational clusters varies among the clusters. In general,

however, women account for relatively high proportions of employment in the faster growing occupations with two exceptions. For natural scientists and computer specialists, the women's share of employment currently is low and the proportion of women employed as engineers, architects, and surveyors is very low (7 percent). Women tend to account for smaller proportions in the occupations projected to decline or grow slowly, except for the proportion of women employed as machine setters and operators.

In summary, occupations requiring the most education and training are projected to grow more rapidly than total employment. Women currently represent larger proportions of employment in those occupations than blacks and Hispanics. Therefore, among the three minority groups, employment opportunities for women are expected to be the most favorable.

—FOOTNOTES—

¹ Data from the 1983, 1984, and 1985 Occupational Employment Statistics (OES) surveys, the most current for each industry in the economy when the projections were developed, were used to develop 1986 occupational staffing patterns for industries covered by the matrix. Staffing patterns for other industries were derived from the 1986 Current Population Survey. For more information concerning the development of the National Industry-Occupation Matrix, see *Employment Projections for 1995: Data and Methods*, Bulletin 2253 (Bureau of Labor Statistics, 1986). For more information concerning the OES survey program, see *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, December 1982).

² The 1986 and projected 2000 occupational distributions in each of the 258 detailed matrix industries were multiplied by estimates of total wage and salary worker employment in each year. Estimates of self-employed and unpaid family workers by occupation for 1986 and projected 2000 were developed at the total (all industry) level based on data in the Current Population Survey. They were added to the sum of wage and salary worker employment to derive estimates of 1986 and projected 2000 total employment by occupation for the economy.

³ In the National Industry-Occupation Matrix, State and local government workers in education and health service industries are included in the services industry division, not in government.