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MONTHLY LABOR REVIEW

U.S. Department of Labor  
Bureau of Labor Statistics  
July 1984

*In this issue:*  
The military  
in the labor force







**U.S. DEPARTMENT OF LABOR**  
**Raymond J. Donovan, Secretary**  
**BUREAU OF LABOR STATISTICS**  
**Janet L. Norwood, Commissioner**

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 The 3-foot high frieze  
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Cover design by Richard L. Mathews





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Henry Lowenstern, Editor-in-Chief  
Robert W. Fisher, Executive Editor

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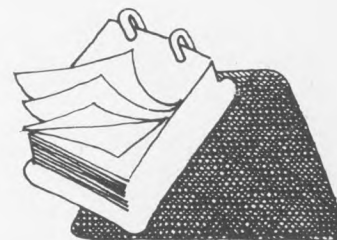
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# Labor Month In Review



**WORKING WOMEN.** At the National Conference on Women, the Economy, and Public Policy in Washington, D.C., June 20, Commissioner of Labor Statistics Janet L. Norwood discussed some of the economic issues facing today's working women, including the female-male earnings gap. Some excerpts from Norwood's address:

**Earnings gap.** The Bureau of Labor Statistics publishes two types of data which can be useful in analyzing the earnings gap. The first set groups together the earnings of all women and compares them to the earnings of all men. These data come from the Current Population Survey (CPS), a sample of 60,000 households throughout the country, which provides considerable demographic detail. The second set of data comes from the BLS occupational wage survey programs. These data are collected from samples of business establishments, which provide detailed information for selected occupations. Both sets of data are important for analysis.

What do the latest data show? According to the CPS, median earnings for women who worked year round, full time were \$13,014 in 1982, or 62 percent of the median for men.

A newer CPS series on the median weekly earnings of full-time wage and salary workers shows a similar earnings ratio.

Can we tell exactly what accounts for these pay differences? The answer is no. Aggregate data at the national level really cannot pinpoint precise reasons for female-male pay differences in specific firms or in specific cities or States. We do know, however, that there are differences in the work history and education and skills that men and women bring to the marketplace, as well as differences in their occupational distribution. When

we "adjust" for some of the differences, the female-male earnings gap is reduced considerably—in some studies by close to one-half.

The BLS establishment wage survey data suggest a narrower female-male gap than the aggregate earnings data do. Data from our survey of professional, administrative, technical, and clerical occupations indicated that the average pay for men in narrowly defined white-collar occupational skill levels generally exceeded the earnings of their female counterparts, but the difference was much smaller than that found in studies using less detailed data. Moreover, in many of these white-collar occupations, women's earnings were closer to men's when viewed within individual establishments.

Researchers who have carried out wage gap studies often point to discrimination as a further explanation of earnings differences. Averages from sample surveys do not give us enough of the information needed to isolate and quantify the amount of the earnings gap due to discrimination.

**Occupational differences.** Of 503 separate, detailed job categories, 5 of the top 10 occupations employing women are in sales and clerical work: secretaries, bookkeepers, cashiers, salesworkers (except apparel), and typists. An additional two are in the female-intensive and relatively low-paying professional jobs of registered nurses and elementary school teachers. Two more are the service occupations of waitresses and nurses' aides.

A number of employed women are clearly moving into higher paying jobs. But we must recognize that, in most cases, the actual number engaged in these occupations remains relatively small.

**Industry attachment.** Where do women work? Mostly, in industries at the bottom of the pay scale. The BLS monthly business payroll survey shows that about two-thirds of all women on nonfarm payrolls work in the service and retail trade industries, and in State and local governments. Only about 1 in 6 works in a goods-producing industry.

**Hours of work; job tenure.** Women tend to work fewer hours and have less seniority than men. Generally women are 2-1/2 to 3 times more likely than men to work part time, if we define part time as less than 35 hours per week. And, even as full-time workers, relatively more women tend to be at the low end of the full-time scale.

The amount of time spent with an employer—seniority—is less for women than men, at least partly because many more women are newer labor force entrants than men. But this situation is changing. There is little or no difference in the number of years young women and men—under age 30—have spent with their current employer. There is a 1- to 2-year difference at ages 30 to 39, and then it jumps to 5 to 7 years' difference for 40- to 64-year olds.

**Workers in families.** We are expanding our data on workers in families, using the monthly household survey. Despite changes in living patterns, most Americans continue to live in families, and many families will continue to have more than one worker. We are now developing a quarterly report—to be issued early next year—on the employment and earnings situation in different types of families.

Single copies of the commissioner's address are available from the Bureau of Labor Statistics, Division of Information Services, Washington, D.C. 20212. □



# Working for Uncle Sam—a look at members of the Armed Forces

*The 'career force' is growing rapidly, as almost half of recruits reenlist; in 1982, the total labor force included 1.7 million men and women assigned to military duty in the United States*

CAROL BOYD LEON

Individuals seeking work may consider the military to be an attractive alternative to a civilian job—especially for those lacking employment experience, facing a tight labor market, looking for a lifetime career, or having strong patriotic feelings. More than 2 million men and women are in the Armed Forces. This article compares the demographic and occupational characteristics of the 1.7 million stationed in the United States with those of civilian workers.<sup>1</sup>

It is especially appropriate to examine data on military personnel, because at the beginning of 1983, the Bureau of Labor Statistics began publishing an unemployment rate which includes the resident Armed Forces in the labor force count. Other statistical series including the resident Armed Forces, such as labor force participation rates, the number of employed, and employment-population ratios, also became available at that time. Calculations have been made for each of these series back to 1950.<sup>2</sup>

These statistical series were made available in accordance with the recommendations of the National Commission on Employment and Unemployment Statistics, which was established in 1978 to study the Nation's labor force data system with regard to its accuracy and relevance to current conditions. The Commission determined that, with the change to a volunteer system in 1973, military employment was

not "substantively different" from civilian employment and thus concluded that military personnel should be counted in national employment and labor force totals.<sup>3</sup> Because the civilian labor force includes only persons residing in the United States, the Armed Forces count is similarly restricted.

## Who are counted?

Monthly data on the Armed Forces are obtained by the Bureau of the Census from the Department of Defense. The Armed Forces count includes persons on active duty in either the regular military or the reserve forces for an extended period. More specifically, six groups are included in the 1982 count of 2.2 million: (1) total military personnel on active duty; (2) Marine reserve forces on active duty training for 6 months or longer; (3) Army reserve forces on active duty training for 4 months or longer; (4) Air Force reserve personnel on tours of duty lasting a minimum of 12 months; (5) National Guard personnel on initial active duty training; and (6) Coast Guard personnel on active duty. Demographic characteristics, which are gathered quarterly, are applied to the monthly counts of the total Armed Forces.

The resident Armed Forces is a subgroup of the total military and consists of military personnel stationed in any of the 50 States. This includes about two-thirds of Army personnel, 80 percent of the Navy and the Air Force, 85 percent of the Marines, and virtually all Coast Guard personnel. Included in the count of Navy personnel are those

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on ships homeported in the United States.<sup>4</sup>

### Trends in size and composition

In the post-World War II period, the total active-duty Armed Forces ranged from a low of 1.4 million in 1948 to 3.6 million in 1952 and 3.5 million in 1968 and 1969. Between 1969 and 1979, this number dropped to 2.1 million, before inching upward to 2.2 million in 1982. The resident Armed Forces ranged from 1.2 million in 1950 at the inception of the data series to 2.4 million in 1952 and 2.3 million in 1968. In 1979, the resident military fell to slightly less than 1.6 million, edging up to 1.7 million in 1982. (See table 1.) While changes in the size of the two Armed Forces counts are directly related, the impact of a military buildup during periods of armed conflict is, of course, greatest on the number stationed overseas and therefore has a larger effect on the total Armed Forces.

Since 1973, monthly changes in the size of the services have been fairly small—generally no more than 5,000 and rarely more than 20,000. These increases and decreases have virtually no effect on the unemployment rate. In fact, the unemployment rate which includes the resident Armed Forces in the labor force base runs just one or two-tenths of a

percentage point below the civilian-based rate, and even the largest changes in the size of the military from month to month have made only a one-tenth of a point difference in the over-the-month movement of the overall unemployment rate.

### Service, gender, and minority status

The Army is the largest branch of the resident Armed Forces with about 545,000 members, or 33 percent of the resident military. The next largest is the Air Force's 460,000, or 28 percent, closely followed by the Navy's 455,000, or 27 percent. About 11 percent of the resident Armed Forces are in the Marine Corps, with 165,000 members, and the Coast Guard, with 40,000, makes up 2 percent.<sup>5</sup>

The number of women in the resident military is relatively small with a total of only about 140,000 in 1982. They were outnumbered by men 11 to 1. However, military women numbered less than 30,000 in 1962, and the ratio of male-to-female personnel declined from 70 to 1 in that year to 43 to 1 in 1972. Over the same period, the ratio among civilian workers dropped from 2 to 1 to 1.3 to 1. With the change to an all-volunteer force in 1973, women joined the military at an increasing rate, reflecting stepped-up recruit-

**Table 1. Members of the Armed Forces by selected characteristics, 1950–82 annual averages**

[Numbers in thousands]

Year	Total Armed Forces		Resident Armed Forces			
	Number	Percent of the total noninstitutional population	Total	Percent of total employment	Women	
					Total	Percent of the resident Armed Forces
1950	1,649	1.5	1,169	1.9	19	1.6
1951	3,098	2.9	2,143	3.5	31	1.4
1952	3,593	3.3	2,386	3.8	38	1.6
1953	3,547	3.2	2,231	3.5	36	1.6
1954	3,350	3.0	2,142	3.4	33	1.5
1955	3,048	2.7	2,064	3.2	31	1.5
1956	2,856	3.4	1,965	3.0	28	1.4
1957	2,799	2.4	1,948	3.0	27	1.4
1958	2,636	2.3	1,847	2.8	27	1.5
1959	2,551	2.2	1,788	2.7	27	1.5
1960	2,514	2.1	1,861	2.8	28	1.5
1961	2,572	2.1	1,900	2.8	29	1.5
1962	2,827	2.3	2,061	3.0	29	1.4
1963	2,737	2.2	2,006	2.9	27	1.3
1964	2,738	2.2	2,018	2.8	27	1.3
1965	2,722	2.1	1,946	2.7	27	1.4
1966	3,122	2.4	2,122	2.8	30	1.4
1967	3,446	2.6	2,218	2.9	32	1.4
1968	3,534	2.6	2,253	2.9	34	1.5
1969	3,506	2.5	2,238	2.8	34	1.5
1970	3,188	2.3	2,118	2.6	37	1.7
1971	2,816	2.0	1,973	2.4	39	2.0
1972	2,449	1.7	1,813	2.2	41	2.3
1973	2,326	1.6	1,774	2.0	49	2.8
1974	2,229	1.5	1,721	1.9	63	3.7
1975	2,180	1.4	1,678	1.9	78	4.6
1976	2,144	1.4	1,668	1.8	86	5.2
1977	2,133	1.3	1,656	1.8	92	5.6
1978	2,117	1.3	1,631	1.7	100	6.1
1979	2,088	1.3	1,597	1.6	108	6.8
1980	2,102	1.2	1,604	1.6	134	7.7
1981	2,142	1.2	1,645	1.6	133	8.1
1982	2,180	1.2	1,668	1.6	139	8.3



ing efforts for both men and women, as well as women's growing participation in the labor force in general. However, since 1979, there has been no growth in the civilian labor force participation of women under 25, and women's entrance into the Armed Forces has slowed. Despite the increasing number of women in the military, their representation in the Armed Forces still does not come anywhere near their share of civilian employment. The following tabulation shows actual and projected numbers of enlisted women during selected fiscal years:<sup>6</sup>

	<i>Numbers, in thousands</i>			<i>Percent of all enlisted members</i>		
	1972	1982	1987	1972	1982	1987
Total .....	31.8	163.2	188.1	1.6	9.0	9.6
Army .....	12.3	64.3	70.1	1.8	9.6	10.1
Navy .....	5.7	37.0	45.6	1.1	7.7	8.7
Marine Corps .....	2.1	7.9	9.1	2.1	4.5	5.0
Air Force .....	11.7	54.1	63.4	2.0	11.3	11.5

It should be noted that each of the services still imposes limits on the number of women. For example, the Army had a limit of 70,000 in 1982.

The distribution of women by service is a bit different than that of men. In 1982, almost 40 percent of enlisted women were in the Army, 33 percent were in the Air Force, 23 percent were in the Navy, and just 5 percent were in the Marine Corps. The tabulation above points out that enlisted women are proportionately best represented in the Air Force, while being outnumbered by male Marines 22 to 1. The situation for women officers in 1982 was quite similar as women comprised 9.2 percent of all officers, but made up 10.4 percent of Air Force officers and just 3.1 percent of Marine officers. Because female officers as a percent of all officers and enlisted women as a percent of total enlistees are each about 9 percent, it can be assumed that women are proportionately about as likely as men to be officers, although there are differences among the branches.

For both sexes combined, officers make up about 18 percent of the resident Armed Forces; the proportion ranges from 11 percent of the Marine Corps to 24 percent of the Air Force, where officer ranks are swelled by the larger number of pilots and various support personnel.

Although most members of the resident Armed Forces are white, blacks make up a large share, as the following percentage distribution shows:

	<i>Total</i>	<i>Men</i>	<i>Women</i>
Total .....	100.0	100.0	100.0
Non-Hispanic			
White .....	74.2	74.6	69.4
Black .....	18.2	17.7	24.2
Other .....	4.0	4.1	3.5
Hispanic origin .....	3.6	3.6	2.9

By comparison, more than 80 percent of civilian workers in a comparable age range—18 to 54—are non-Hispanic whites,<sup>7</sup> while less than 75 percent of the resident military is in that category. The number of Hispanics, Asian-Americans, and other nonblack minorities in the military is rel-

atively smaller than their number in the population. In contrast, the proportion of black men in the Armed Forces is twice that among civilian workers, and the ratio is even a bit higher for black women. Before the late 1960's, the representation of black men in the Armed Forces was disproportionately low when compared with their share of civilian male employment. Noting the increasing percentage of blacks in the military since the mid-1960's, one analyst attributed it to three factors: "(1) a dramatic increase over time in the proportion of blacks found eligible for military service; (2) particularly high unemployment rates that plagued the young black population during the beginning of the volunteer force; and (3) a lag in earning potential for young blacks in the civilian work force."<sup>8</sup>

The civilian employment situation for black youth has not improved since the start of the all-volunteer military—in fact, the jobless rate for 18- and 19-year-olds rose from about 28 percent in 1973 to nearly 48 percent in 1982—and so the disproportionately high participation of blacks in the military is still quite relevant. During economic downturns, more blacks than whites enter the military from outside the labor force rather than from the ranks of the unemployed.<sup>9</sup> Many of the blacks outside the labor force had not sought jobs in the civilian economy because of the poor employment situation they faced. Thus, the continually high jobless rates for young blacks directly contributed to their military enlistments during recent years. Another factor contributing to the growing proportion of blacks in the military was shown in a recent study<sup>10</sup> which found that blacks who complete their first enlistment are more likely than other racial groups to reenlist.

### **Youthfulness predominant**

As expected, persons in the military tend to be younger than civilian workers. Among both men and women in the resident Armed Forces, only 1 or 2 percent are age 45 or older; among civilian workers, more than 30 percent are in this age group. The recent increase in the number of military women helps account for their especially large concentration in the younger age groups. Ninety-five percent are under age 35, compared with less than half of civilian women workers, and more than half of the military women are under age 25. (See table 2.)

The relative youthfulness of members of the Armed Forces indicates that a large number of men and women in the resident military view their time in the military as a transition between school and civilian jobs. However, half of these men and two-fifths of the women are at least 25 years old and thus are not in a first enlistment from high school. The 1980 National Longitudinal Survey found that men and women with a high degree of satisfaction with their military jobs are more likely to extend their term of service. While the study notes that this may seem to be a trivial finding, "it suggests that the usual view of military service as a transitory rather than a permanent career-oriented job may not be



**Table 2. Military personnel and civilian employment by age and sex, 1982**

[Numbers in thousands]

Age	Men			Women		
	Total Armed Forces <sup>1</sup>	Resident Armed Forces <sup>1</sup>	Civilian employment <sup>2</sup>	Total Armed forces <sup>1</sup>	Resident Armed Forces <sup>1</sup>	Civilian employment <sup>2</sup>
Total . . . . .	1,908	1,536	56,271	189	143	43,256
Percent . . . . .	100.0	100.0	100.0	100.0	100.0	100.0
16 to 17 years . . . . .	.5	.6	2.3	.3	.4	2.8
18 to 19 years . . . . .	11.4	12.3	3.7	11.2	12.3	4.6
20 to 24 years . . . . .	38.4	38.1	12.8	48.0	46.5	15.0
25 to 34 years . . . . .	33.3	32.5	28.4	36.3	36.3	28.1
35 to 44 years . . . . .	14.5	14.6	21.2	3.7	3.9	20.8
45 to 54 years . . . . .	1.9	2.0	16.4	.5	.5	15.5
55 years and over . . . . .	.1	.1	15.2	—	—	13.4

<sup>1</sup>As of September 1982.

<sup>2</sup>Annual averages for 1982.

NOTE: Dashes indicate data round to less than 0.1 percent.

relevant for most youths.”<sup>11</sup>

Another way to view the issue of temporary job versus career is by examining reenlistment rates. Among first-term members of the military, an increasing proportion—about 47 percent—chose to reenlist in 1982. In fact, since 1973, the proportion has been rising among all military members, reaching 68 percent in 1982.<sup>12</sup> Another way to examine this issue is in terms of the “career force”—that is, the body of enlisted personnel with more than 4 years of service. In 1982, the career force made up 46 percent of the total enlisted strength, up from 33 percent in 1971 and 41 percent in 1976.<sup>13</sup>

As previously mentioned, there are relatively few military members above age 45. In part, this results from the eligibility for partial pensions beginning after 20 years of service when the retiree may be as young as age 38. In fact, the retirement age of the average enlisted retiree is 42, and the average retiring officer is 45. Moreover, persons over 35 are generally precluded from enlisting in the Armed Forces, so that the young retirees cannot be replaced by older civilian workers. Officers tend to be somewhat older than enlisted personnel in that they usually join the military later because of additional schooling and retire after serving an average of 2 years longer than enlistees. Close to 8 percent of the officers are age 45 or older, compared with only 1 percent of enlisted personnel. There is little difference in the age distribution of all persons in the Armed Forces compared with that of the resident military, except that the latter includes a slightly larger proportion of 18- and 19-year-olds, reflecting the fact that initial military training takes place within the United States.

**Family status**

Times have changed since World War I when military regulations required enlisted men and junior officers to be unmarried. In 1982, a little more than half of the men in the resident Armed Forces were married. Not surprisingly, however, a higher proportion of civilian male workers were

married—about three-fifths of those in the most comparable ages (18 to 44). Among military women, about two-fifths were married, compared with close to half of comparable aged (18 to 34) women with civilian jobs. Part of the difference is attributed to the fact that the majority of military women were under 25, while the civilian workers were most often over 25. In addition, the military traditionally has served as a transitional period for many persons just out of school and who do not yet have family obligations. Women, in particular, typically join the Armed Forces before marriage and often do not reenlist once marriage and family responsibilities make military life more difficult to adapt to. However, women are more likely than men to complete their initial term of service, and to reenlist at higher rates when they reach the end of their first term. At later reenlistment periods, reenlistment rates for men exceed those for women.<sup>14</sup> About 45,000,<sup>15</sup> or two-thirds of all married military women, were married to military men.

According to data from the March 1982 supplement to the Current Population Survey, there are nearly a half million married-couple families with children under age 18 whose fathers are in the Armed Forces. This represents three-fourths of all military married-couple families (that is, the husband is in the service and the wife is a civilian). On average, civilian families are older than military families, and are less apt to include children; in fact, only half have children under age 18. In addition to the half million married military men with children, there were about 12,000 military fathers raising their children alone, and a number of military mothers doing the same. When the husband was in the Armed Forces, close to half of the families included preschoolers, compared with one-fourth of all civilian husband/wife families; this again points to the relative youthfulness of persons in the military.

Historically, military wives were less likely to work outside the home than were civilian wives, as frequent moves, limited job opportunities, extended separations from their husbands, the longstanding custom of volunteer activities, and young children were obstacles to paid employment.<sup>16</sup> Nevertheless, the labor force participation of Armed Forces wives has been rising rapidly since the early 1970’s, increasing by 25 percentage points in the past decade to nearly 52 percent in 1982. While this rate almost matched that for civilian wives, the labor force participation of wives of employed civilians was much higher—about 59 percent. Wives of civilian workers tend to be younger than all civilian wives, as their husbands generally are of preretirement age.<sup>17</sup> (Data are not available from the Current Population Survey on married-couple families where the wife is in the Armed Forces, on military mothers raising their children alone, and on the labor force participation of civilian husbands of military wives.)

**Occupational comparisons**

To liken military and civilian occupations could very well



resemble a comparison of apples and oranges. After all, combat-related occupations do not usually exist for civilians. In reality, however, only a small—and shrinking—proportion of the military performs combat and other specific military duties. During World War I, about 40 of every 100 soldiers had direct combat-related jobs. By World War II, the number had dropped to 30 of every 100, and during the height of the Vietnam conflict fewer than 13 of every 100 had combat assignments.<sup>18</sup> In 1982, only 9 of every 100 persons in the resident military were classified in the infantry, gun crews, air crews, and seamanship specialist category. Most other military personnel held jobs similar to those of civilians, such as managers, clerks, musicians, and nurses, although a small proportion provided support for combat-related jobs.

The distribution of military occupations differs from that of civilians as shown in table 3. Among enlisted men, craftworkers make up the largest category; about 42 percent of these workers are mechanics and repairers, compared with 21 percent of civilian men age 18 to 54. Professional, technical, and managerial workers and clerical and administrative workers each account for about 16 percent of enlisted men. Among civilian men, professional, technical, and managerial workers account for more than 30 percent of the employed and clerical, administrative, and sales an additional 12 percent. The remaining enlisted men have service, operative, and laborer jobs (10 percent) or general military duties (16 percent). Male officers, as might be expected, are found primarily in professional, technical, and managerial jobs. A large group—about 40 percent—are in such tactical categories as pilots and artillery officers.

Among women, a different picture emerges in that enlisted women tend to perform duties other than those assigned to their male counterparts. (It should be noted that women are excluded from various combat occupations by

law.) Occupations of enlisted and civilian women are somewhat similar. The largest proportion of both groups (41 percent of military women and 35 percent of civilians) are in clerical and administrative fields. About 30 percent of enlisted women and one-fourth of their civilian counterparts have professional, technical, or managerial positions. But where close to 17 percent of the military women are craftworkers (such as aircraft and auto mechanics and electronic equipment repairers), only 2 percent of the nonmilitary women are so employed. Work in the service, operative, and laborer categories is much more common among civilian women (29 percent) than among their enlisted counterparts. General military duties are performed by less than 1 percent of the enlisted women. The jobs of female officers, like those of male officers, are concentrated in professional, technical, and managerial fields. Almost half are medical officers, including nurses, doctors, pharmacists, and other health professionals.

### Educational attainment

Education is an important consideration of the military. For example, the educational attainment of recruits is used as an enlistment standard. The military also sets goals regarding the enlistment of both high school graduates and those who score in the upper half of the Armed Services Vocational Aptitude Battery Test, in part, because military personnel who hold high school diplomas tend to have lower attrition rates and fewer disciplinary problems.<sup>19</sup> Schooling is also used as an enlistment incentive, as new members of the Armed Forces receive skill training and later may attend more specialized classes. Of course, many veterans and active duty personnel have also taken advantage of high school and college courses.<sup>20</sup>

How similar or dissimilar are the educational backgrounds of persons in the resident military and those of employed civilians? Among teenagers (age 18 and 19), those in the military are much more likely to be high school graduates than are their civilian counterparts. (See table 4.) Only 15 percent of the 18- and 19-year-old men and 3 percent of women in the military do not have a high school diploma. In the next age group, however, the opposite generally is true—that is, the educational attainment of civilian workers surpasses that of members of the Armed Forces among the 20- to 24-year-olds, as fewer military personnel than civilians in that age category have attended college. Some of the 20- to 24-year-old civilian workers, of course, were both working and attending college or had recently graduated.

Military personnel, age 25 to 34, were old enough to have attended college before enlisting, or to have attended while in the military, and more than a fifth of these men and a fourth of these women had attended at least 4 years of college. Many view the military as a career, rather than as a transitional phase between high school and civilian employment. The proportion of college graduates among the 25- to 34-year-old civilian men is slightly higher than that

**Table 3. Resident military personnel and civilian employment by occupation, sex, and age, 1982**

(Percent distribution)

Occupation	Men		Women	
	Enlisted Armed Forces <sup>1</sup>	Civilian employment <sup>2</sup>	Enlisted Armed Forces <sup>1</sup>	Civilian employment <sup>2</sup>
Total employed	100.0	100.0	100.0	100.0
Professional, technical, and managerial workers	16.1	31.5	29.9	26.4
Clerical and administrative workers	15.6	6.4	41.2	35.2
Sales workers	—	6.1	—	6.4
Craft and kindred workers	42.3	21.0	17.1	2.1
Mechanics and repairers	37.1	6.2	14.9	.2
Other craftworkers	5.2	14.8	2.2	1.9
Service workers, operatives, and laborers	10.1	31.7	11.0	28.9
Farm workers	—	3.3	—	1.0
General military workers	15.9	—	.9	—

<sup>1</sup>As of September 1982; data exclude officers.

<sup>2</sup>Annual averages for 1982; data relate to persons age 18 to 54.

NOTE: Dashes indicate data round to less than 0.1 percent.



**Table 4. Educational attainment of resident military personnel and civilian employment by sex and age, 1982**

[Percent distribution]

Educational attainment and sex	Total	16 to 17 years	18 to 19 years	20 to 24 years	25 to 34 years	35 to 44 years	45 years and over
<b>MEN</b>							
Resident Armed Forces <sup>1</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High school: Less than 4 years	7.5	30.2	14.6	10.4	3.7	2.4	2.1
4 years only	67.3	69.7	84.9	79.8	59.2	43.9	24.5
College: Less than 4 years	10.4	.1	.6	5.6	15.4	20.1	17.9
4 years or more	14.7	—	—	4.3	21.7	33.6	55.6
Civilian employment <sup>2</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High school: Less than 4 years	21.6	97.2	37.2	15.0	11.3	17.6	29.6
4 years only	37.5	2.5	54.1	49.2	37.9	35.6	34.1
College: Less than 4 years	17.9	.3	8.8	25.8	21.9	17.6	13.4
4 years or more	23.0	—	—	10.0	28.9	29.2	23.0
<b>WOMEN</b>							
Resident Armed Forces <sup>1</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High school: Less than 4 years	1.0	5.7	2.9	1.0	.4	.2	.1
4 years only	70.8	94.2	95.6	81.9	53.4	26.3	9.0
College: Less than 4 years	12.6	.2	1.4	10.3	18.7	21.3	18.0
4 years or more	15.5	—	—	6.8	27.5	52.2	72.9
Civilian employment <sup>2</sup>	100.0	100.0	100.0	100.0	100.0	100.0	100.0
High school: Less than 4 years	17.9	95.0	27.5	8.5	8.7	15.3	25.0
4 years or more	45.0	5.0	58.9	48.5	41.6	46.4	47.3
College: Less than 4 years	19.5	—	13.5	30.0	23.2	18.2	14.2
4 years or more	17.6	—	.1	13.0	26.5	20.2	13.9

<sup>1</sup>As of September 1982.<sup>2</sup>As of March 1982.

NOTE: Dashes indicate data round to less than 0.1 percent.

of military men, but women in and out of the military are about equally likely to have completed college. Only very small numbers of military men and almost no military women are high school dropouts, while substantial proportions of employed civilians do not have a high school diploma, and these proportions rise with age (to 30 percent for men and 25 percent for women 45 years and over). Among military personnel in this age group, more than half of the men and nearly three-fourths of the women have college degrees; it can be assumed that most are officers. In fact, 97 percent of the commissioned officers of all ages are graduates, compared to 2 percent of enlisted personnel.<sup>21</sup>

### Compensation

The military has an unusual pay structure in that it is a combination of cash earnings and allowances, plus various in-kind allowances and benefits. The total compensation received, unlike that of civilian workers, is partially determined by marital and family status and is based on rank and years in service, rather than on occupation and seniority. Any attempt to compare military and civilian pay is fraught with problems.

Regular military compensation is a combination of basic pay, quarters allowance, variable or station housing allowance, subsistence allowance, and the tax advantages associated with these tax-free allowances.<sup>22</sup> In addition to regular military compensation, special pay and allowances are provided for hazardous, sea, or foreign duty, special skills, to maintain uniforms, and the maintenance of two households during periods of separation. Fringe benefits include a non-

contributory retirement plan which starts to pay after a minimum of 20 years of service at 50 percent of base pay, and rises to 75 percent with 30 years; medical coverage for military personnel and their families; discounted prices for the purchase of food, clothing, and housewares at post exchanges and commissaries; and coverage under the social security system.

Monthly basic pay for fiscal 1982 ranged from \$573 to \$2,215 for enlisted personnel and from \$1,099 to \$5,317 for commissioned officers, depending on rank and years of service. Basic allowances relate to rank and dependent family members or marital status. About half of the military personnel live in government quarters while a smaller proportion receives subsistence in kind.<sup>23</sup> But enlisted personnel without family members who received cash allowances for quarters were given from \$123 to \$272; allowances for commissioned officers ranged from \$224 to \$509. Military personnel with families received from \$214 to \$383 if enlisted and \$291 to \$636 if commissioned. The variable housing allowance is granted to those persons stationed in high-cost areas. Allowances for subsistence are less complicated; enlisted members received about \$142 and officers received \$98. Finally, the value of the income tax advantage varies with each person's own family and income situation.

An example is a male member of the Armed Forces with a civilian spouse and one child who live together off base. If in 1982 he had been in the Army for 8 years and was an E-6 staff sergeant, he earned \$1,103 per month in basic pay. His allowance for subsistence was \$4.68 per day or \$140 per month. His allowance for quarters was \$303. His

monthly tax advantage was estimated at \$110. The total annual Basic Military Compensation—the sum of these four items—was about \$19,900. If the family lives in a high-cost area, the Variable Housing Allowance of, say \$188 per month (in Washington, D.C.) brought the annual salary—now called Regular Military Compensation—to about \$22,100.

IN SUMMARY, available data indicate that the military is an attractive alternative to many jobseekers—including some without work experience, some who desire occupational training, some who have strong feelings of patriotism, and

some who are looking for a lifetime career. Persons in the Armed Forces tend to be younger than civilian workers and include relatively more blacks but fewer women. About half the men and two-fifths of the women are married. Combat jobs are not prevalent—fewer than 9 of every 100 persons in the resident military hold them—and crafts predominate among enlisted men, while enlisted women are more likely to hold clerical and administrative positions. Officers generally can be classified as professional, technical, and managerial workers. The 1.7 million members of the resident Armed Forces are, indeed, an important part of the U.S. economy. □

—FOOTNOTES—

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<sup>1</sup>Because 1982 data on the Armed Forces were tabulated specifically for this article by the Department of Defense, civilian data obtained from the Current Population Survey also refer to 1982. The Current Population Survey (CPS) is a sample survey of about 60,000 households conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics.

<sup>2</sup>It should be noted that those series exist only for three groups: men age 16 and over, women age 16 and over, and both sexes combined.

<sup>3</sup>See *Counting the Labor Force* (Washington, National Commission on Employment and Unemployment Statistics, Labor Day 1979), pp. 49–51.

<sup>4</sup>These are ships whose homeport is in the United States and are not deployed to the Mediterranean, the Mideast, the Far East, or the Indian Ocean. The actual location of all Navy ships is reported annually to the Bureau of the Census and the ratio of persons on ships deployed to the above locations to the total number afloat is applied to the monthly count of Navy personnel on ships.

Department of Defense data provided for this article include all Navy personnel on ships—bringing the resident forces to 95 percent of the Navy—and this helps account for the fact that the total resident military count in the tables shown in this article is slightly higher (less than 1 percent) than the total generally used by the Bureau of Labor Statistics. In addition, the detailed data shown for the Armed Forces refer to September 1982 (the end of fiscal 1982) unless otherwise noted, while the civilian data used for comparison purposes generally are 1982 annual averages.

<sup>5</sup>These data are those used by the Census Bureau to calculate the size of the resident Armed Forces for the CPS. Department of Defense data provided specifically for this article and used throughout most of the remaining text show a 31-percent share for the resident Army, 31 percent for the Navy, 27 percent for the Air Force, and 11 percent for the Marine Corps.

<sup>6</sup>This tabulation, showing enlisted women in the total Armed Forces, is from the *Military Manpower Task Force, A Report to the President on the Status and Prospects of the All-Volunteer Force*. Rev. ed. (Washington, 1982), pp. II–18.

<sup>7</sup>It is not possible to directly count the number of non-Hispanic whites from the CPS, because in that survey race and ethnic origin are determined independently. There is evidence that most Hispanics are classified as white. In order to compare data for military and civilian workers, Hispanic

civilian employment was subtracted from white civilian employment (in both instances for persons age 18–54) to arrive at a civilian employment level for non-Hispanic whites. However, because a small number of Hispanics are black or other nonwhite races, the actual proportion of non-Hispanic whites is slightly higher than that shown.

<sup>8</sup>Richard V. L. Cooper, *Military Manpower and the All-Volunteer Forces* (Santa Monica, Calif., The Rand Corp., 1977), p. 210.

<sup>9</sup>See Charles Dale and Curtis L. Gilroy, "The Effects of the Business Cycle on the Size and Composition of the U.S. Army," *Atlantic Economic Journal*, March 1983, p. 45.

<sup>10</sup>Choongsoo Kim, *Youth and the Military Services: 1980 National Longitudinal Survey Studies of Enlistment, Intentions to Serve, Reenlistment and Labor Market Experience of Veterans and Attriters* (Columbus, Ohio State University, Center for Human Resource Research, 1982), p. 81.

<sup>11</sup>Kim, *Youth and the Military Services*, p. 88.

<sup>12</sup>Department of Defense, *Selected Manpower Statistics, Fiscal Year 1982* (Washington, 1983), tables 2–25 and 2–26.

<sup>13</sup>*Military Manpower Task Force*, p. III–9

<sup>14</sup>*Ibid.*, p. II–18.

<sup>15</sup>*Ibid.*, p. II–18.

<sup>16</sup>Allyson Sherman Grossman, "The employment situation for military wives," *Monthly Labor Review*, February 1981, pp. 60–62.

<sup>17</sup>These data are from the March 1982 supplement to the Current Population Survey.

<sup>18</sup>Sar A. Levitan and Karen C. Alderman, *Warriors At Work* (Beverly Hills, Calif., Sage Publications, Inc., 1977), p. 141.

<sup>19</sup>Levitan and Alderman, *Warriors At Work*, pp. 23–25.

<sup>20</sup>Through September 1982, a total of 7.9 million veterans received financial educational assistance under the post-Korean GI Bill; 4.8 million of these attended college. During fiscal year 1982, more than three-quarters of a million veterans received financial assistance to attend college, and more than 200,000 participated in other educational and training programs. See *Veterans' Benefits Under Current Education Programs, Fiscal Year 1982* (Veterans Administration, 1983), RSM70–83–1, pp. 12 and 18.

<sup>21</sup>Department of Defense, *Selected Manpower Statistics, Fiscal Year 1982*, table 2–5.

<sup>22</sup>Public Law 96–579, Dec. 23, 1980.

<sup>23</sup>Martin Binkin and Irene Kyriakopoulos, *Paying the Modern Military* (Washington, The Brookings Institution 1981), p. 15.



# The changing composition of the military and the effect on labor force data

*With the end of the draft and the beginning of an all-volunteer military force in 1973, the racial composition of the services has changed significantly and complicates interpretation of labor force data based on the civilian population alone*

HAL SIDER AND CHERYL COLE

January 1983 marked the 10th anniversary of the all-volunteer Armed Forces; since the end of the draft, important changes in the size and demographic composition of the military have occurred. These changes have implications for the analysis of labor force statistics, which have traditionally focused on civilians. Recognizing that this distinction is increasingly archaic in the context of an armed force that competes in the job market for its work force, beginning in January 1983, the Bureau of Labor Statistics began to count domestic military personnel as employed members of the aggregate labor force.<sup>1</sup> The data cited in this article incorporate the total (foreign and domestic) military population. Roughly 80 percent of military personnel are stationed in the United States.

This article examines some of the changes that have occurred in the military as a result of the advent of the all-volunteer Armed Forces. Trends in labor force data which include individuals in the military are compared with traditional statistics that measure the civilian labor market.

Demographic changes in the composition of the military in recent years affect the analysis of labor force trends based on the civilian population alone. The effect is greatest for males, ages 16 to 24, a group that makes up roughly 50 percent of the Armed Forces. As measured by civilian em-

ployment-to-population ratios and unemployment rates, the labor market experience of nonwhites has worsened considerably relative to that of whites in recent years. The analysis indicates, however, that roughly 30 percent of the relative decline can be attributed to changes in the demographic composition of the military alone.

## Changes in the military since 1972

*Size.* When the shift to an all-volunteer force<sup>2</sup> was completed in January 1973, the military was in the midst of significant changes. By January 27, 1973, the last U.S. combat troops were withdrawn from Vietnam and the size of the Armed Forces was already declining rapidly. The military population reached post-World War II peaks in 1968 and 1969 when there were more than 3.5 million active duty personnel. By January 1973, the total size of the military was 2.3 million. As the following tabulation shows, draftees made up a declining share of recruits in the years prior to 1973:

Year	Percent
1968 .....	41
1969 .....	33
1970 .....	33
1971 .....	29
1972 .....	7
1973 .....	8
1974-82 .....	0

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In 1968, there were 340,000 draftees and fewer than 40,000 in 1972, according to the U.S. Department of Defense's Office of Accession Policy.

Between 1973 and 1980, the size of the military fell 10 percent to 2.1 million but then increased slightly to 2.2 million in 1982. The distribution of the military population among the various services has been relatively steady since 1973. In 1982, the Army made up roughly 36 percent of personnel on active duty; the Navy, 26 percent; the Air Force, 27 percent; the Marines, 9 percent; and the Coast Guard (now administered by the Department of Transportation), 2 percent.<sup>3</sup>

**Race.** The change in the racial composition of the military is perhaps the most often cited result of the all-volunteer force. In fact, since 1973 this change has been quite dramatic. The proportion of the military (in percent) made up by nonwhites roughly doubled between 1972 and 1982 and tripled between 1963 and 1982. The proportion of the population made up by nonwhites increased from 10 to 13 percent over the period. The following tabulation shows the percentage of males of all ages in the Armed Forces and in the population as a whole.

Year	Armed Forces	Total population
1963 .....	7.8	10.1
1972 .....	12.3	10.9
1982 .....	23.2	12.9

As late as 1970, nonwhites were actually less than proportionately represented in the military. Currently, the proportion of the military made up of nonwhites is at a high (23 percent) and is roughly double the nonwhite share of the total population. Following the formation of the volunteer force, the proportion of nonwhite officers has grown from 3 percent in 1972 to 8 percent in 1981.<sup>4</sup> Roughly 85 percent of nonwhites in the military are black. This figure has remained fairly constant during the 1970's.<sup>5</sup>

**Sex.** The proportion of the military made up by women is low compared with civilian employment. However, the number of women on active duty has grown very rapidly in recent years, increasing more than fourfold in the last decade. In 1972, slightly more than 43,000 women were in the Armed Forces, making up less than 2 percent of the total personnel. In 1982, 190,000 women were in the military, accounting for about 9 percent of the total. In comparison, women made up 36 percent of all civilian employment in 1972 and roughly 40 percent in 1982. In 1982, women made up 9 percent of the Army; 8 percent of the Navy; 11 percent of the Air Force; and 4 percent of the Marines. Trends in the racial composition of female personnel are similar to those among males. In 1982, 29 percent of the women were nonwhite, compared with 12 percent in 1972.

**Age.** Changes in the age composition of the Armed Forces have also occurred during the same period, but they have

been less dramatic than those in the race and sex classifications. In the early 1960's, before large-scale American participation in Vietnam, teenagers made up roughly 18 percent of the Armed Forces. At the height of the Vietnam conflict, 1969-71, the proportion of teenagers fell to 12 percent. The proportion of teenagers again approached pre-Vietnam War levels in the mid-1970's after implementation of the all-volunteer force. However, this proportion has fallen steadily in recent years, reflecting increased efforts by the Armed Forces to attract and retain older and more highly educated recruits. The following tabulation shows the age distribution (in percent) of the male Armed Forces population for selected years:

	16 to 19	20 to 24	25 and over
1963 .....	18.4	35.4	46.2
1969 .....	11.9	52.1	36.0
1973 .....	16.5	41.4	42.1
1982 .....	12.7	38.6	48.7

Trends in the "quality" of recruits are observed in data on the proportion of recruits having at least a high school diploma. The proportion fell from 67 percent in 1972 to 61 percent in 1974 but increased to more than 86 percent in 1982. In contrast, 74 percent of the total youth population ages 18 to 23 were high school graduates in 1982.<sup>6</sup>

### Labor force trends

This section incorporates data on the Armed Forces population into the analysis of labor market trends. The focus of the analysis is on males ages 16 to 24. In recent years, there has been a marked divergence in the civilian employment-to-population ratios and unemployment rates of whites and nonwhites in this age group. Table 1 shows that civilian employment-to-population ratios have fallen and unemployment rates have risen rather dramatically for nonwhites in recent years. Measures of labor market performance were fairly stable for whites, at least until the onset of the 1981-82 recession. There are no generally accepted explanations for the causes of the racial divergence in labor market performance.<sup>7</sup>

**Table 1. Civilian employment-to-population ratios and the unemployment rate for males, ages 16 to 24, selected years, 1963-82**

Year	Employment-to-population ratio		Unemployment rate	
	White	Nonwhite	White	Nonwhite
1963 .....	61.5	55.5	11.0	20.1
1970 .....	63.0	53.3	10.2	17.4
1973 .....	67.8	52.4	8.8	17.9
1974 .....	67.7	50.3	10.1	21.5
1975 .....	63.1	43.9	15.1	27.2
1976 .....	65.0	44.6	13.4	25.7
1977 .....	67.5	44.6	11.5	26.8
1978 .....	69.5	46.4	9.9	25.0
1979 .....	69.6	48.6	9.9	22.0
1980 .....	66.7	45.5	13.0	26.2
1981 .....	65.7	42.8	13.8	28.7
1982 .....	62.3	39.6	16.9	33.9



The addition of the military population to data on the civilian labor force necessarily increases employment-to-population ratios and decreases "civilians only" unemployment rates.<sup>8</sup> The extent of the adjustment for different demographic groups, however, is larger or smaller depending on the proportion of the group's population in the military. Data on the female labor force, for example, are only negligibly affected due to the small number of women in the military.

**Table 2. Comparison of civilian and total labor force statistics<sup>1</sup> for males, selected years, 1963-82**

[In percent]

Measure and year	White			Nonwhite		
	Total	Civilian	Difference <sup>2</sup>	Total	Civilian	Difference
<b>Employment-to-population ratio</b>						
Ages 16 to 19:						
1963	49.5	44.7	4.8	40.7	37.4	3.3
1970	52.3	49.6	2.7	38.0	35.5	2.4
1973	56.4	54.3	2.0	37.2	33.9	3.3
1974	56.3	54.4	1.9	35.9	32.4	3.5
1975	52.7	50.6	2.1	31.5	27.8	3.7
1976	53.5	51.5	1.9	30.5	27.4	3.1
1977	56.1	54.4	1.7	30.8	27.7	3.2
1978	57.7	56.3	1.5	33.2	30.0	3.2
1979	57.0	55.7	1.3	33.6	30.2	3.3
1980	54.8	53.4	1.4	32.0	28.5	3.5
1981	52.8	51.3	1.5	29.4	26.1	3.4
1982	48.5	47.0	1.6	25.7	22.7	3.0
Ages 20 to 24:						
1963	82.4	79.1	3.4	77.4	74.8	2.7
1970	81.5	76.8	4.7	77.1	72.9	4.2
1973	82.2	80.2	2.0	73.9	70.9	3.0
1974	81.6	79.8	1.8	72.2	68.8	3.4
1975	76.3	74.3	2.0	64.6	60.3	4.3
1976	78.5	76.9	1.6	66.0	62.0	4.0
1977	80.2	76.7	3.5	65.0	61.0	4.0
1978	81.9	80.6	1.3	66.1	62.0	4.1
1979	82.3	81.1	1.2	69.5	65.7	3.8
1980	78.9	77.5	1.3	65.5	61.0	4.5
1981	78.3	77.0	1.4	62.9	58.0	4.9
1982	75.5	73.9	1.6	59.8	54.4	5.3
<b>Unemployment rate</b>						
Ages 16 to 19:						
1963	13.5	15.9	2.4	24.7	27.3	2.7
1970	12.4	13.7	1.3	23.0	24.9	1.9
1973	11.4	12.3	.9	24.1	26.0	1.9
1974	12.7	13.5	.8	28.2	31.4	3.2
1975	17.1	18.3	1.2	31.2	35.1	3.9
1976	16.2	17.3	1.1	31.9	35.6	3.7
1977	14.1	15.0	.9	33.3	36.7	3.4
1978	12.8	13.5	.7	30.8	34.1	3.3
1979	13.3	14.0	.6	28.2	31.4	3.2
1980	15.4	16.2	.7	30.7	34.3	3.6
1981	17.0	17.9	.9	33.8	37.6	3.8
1982	20.7	21.7	1.0	40.1	44.0	4.0
Ages 20 to 24:						
1963	6.4	7.8	1.4	13.7	15.6	1.8
1970	6.0	7.8	1.8	10.4	12.6	2.3
1973	5.8	6.6	.8	11.3	12.9	1.6
1974	7.0	7.8	.8	13.6	15.6	2.0
1975	12.0	13.1	1.2	19.6	22.7	3.1
1976	10.0	10.9	.9	17.9	20.6	2.7
1977	8.6	9.3	.7	18.7	21.4	2.8
1978	7.1	7.7	.6	17.3	20.0	2.7
1979	6.9	7.5	.6	14.8	17.2	2.3
1980	10.3	11.1	.8	18.9	22.1	3.1
1981	10.7	11.6	.9	20.7	24.3	3.6
1982	13.3	14.3	1.0	25.0	29.2	4.3

<sup>1</sup>Total includes civilian and Armed Forces.

<sup>2</sup>Numbers may not add to totals because of rounding.

The starting point for the analysis is the construction of the ratio of the Armed Forces population to total population for various demographic groups. The data reveal a long-term trend toward a reduced role for the military in the life of young adults, particularly for whites. This is, of course, due to a larger population (the entry of the baby-boom cohort into the labor force) as well as changes in the military. The tabulation below shows the male military population to total population (in percent) by age and race, for selected years:

Year	16 to 19		20 to 24	
	White	Nonwhite	White	Nonwhite
1963	8.7	5.2	16.0	10.6
1972	4.2	3.8	12.1	11.1
1974	4.2	5.1	8.7	10.9
1982	2.9	3.9	6.2	11.7

Before the all-volunteer force, enlistment-to-population ratios were uniformly higher for whites than nonwhites. Since that time, however, enlistment ratios have been uniformly higher among nonwhites. The phasing out of the draft has resulted in a decrease in the proportion of white males ages 20 to 24 in the military, as well as in the proportion of white teenagers.

Table 2 presents total (including Armed Forces) and civilian labor force data for male teenagers and young adults. For whites, the difference between total and civilian labor force statistics is greatest in the years before the formation of the volunteer Armed Forces because whites were more than proportionally represented in the Armed Forces at that time. As enlistment-to-population ratios fell for whites, the wedge between civilian and total labor force statistics narrowed. Thus, the declines in white civilian employment-to-population ratios are smaller than the decline in the employment-to-population ratio for the total population. In fact, for white teenagers, an increase of 2.3 points in the civilian employment-to-population ratio between 1963 and 1982 was more than offset by declines in military enlistment. The total employment-to-population ratio for white teenagers fell by 1 percentage point over the period. Similarly, increases in civilian unemployment rates for whites over the past 20 years are smaller than the increase observed in total unemployment data.

The data for nonwhites reveal the opposite pattern. The wedge between total and civilian labor force statistics is greater in the postdraft era, as blacks came to account for a growing share of the Armed Forces population. As such, the decline in the nonwhite civilian employment-to-population ratio is greater than the decline in the employment-to-population ratio for the total population. Similarly, the increases in nonwhite civilian unemployment rates exceed changes in unemployment for the total labor force.

Thus, examination of data on the civilian labor force alone is insufficient in determining the relative labor market experience of white and nonwhite youth. More specifically, the racial gap in the civilian employment-to-population ratio

**Table 3. Racial differences in the civilian and total labor force, 1963-82**

Measure and year		Total	Civilian	Measure and year		Total	Civilian
<b>Employment-to-population ratio<sup>1</sup></b>				<b>Unemployment rate<sup>2</sup></b>			
Ages 16 to 19:				Ages 16 to 19:			
1963	8.8	7.2	1963	11.2	11.4		
1973	19.2	20.4	1973	12.7	14.5		
1974	20.4	22.0	1974	15.5	17.9		
1975	21.2	22.8	1975	14.1	16.8		
1976	23.0	24.1	1976	15.7	18.3		
1977	25.3	26.7	1977	19.2	21.7		
1978	24.5	26.3	1978	18.0	20.6		
1979	23.4	25.5	1979	14.9	17.4		
1980	22.8	24.9	1980	15.3	18.1		
1981	23.4	25.2	1981	16.8	19.7		
1982	22.9	24.3	1982	19.4	22.3		
Ages 20 to 24:				Ages 20 to 24:			
1963	5.0	4.3	1963	7.4	7.8		
1973	8.3	9.4	1973	5.5	6.3		
1974	9.4	11.0	1974	6.6	7.8		
1975	11.7	14.0	1975	7.6	9.5		
1976	12.5	14.9	1976	7.9	9.7		
1977	15.2	17.7	1977	10.1	12.1		
1978	15.8	18.6	1978	10.2	12.3		
1979	12.8	15.4	1979	7.9	9.7		
1980	13.4	16.5	1980	8.6	11.0		
1981	15.4	19.0	1981	10.0	12.2		
1982	15.8	19.5	1982	11.7	14.7		

<sup>1</sup>White rate minus nonwhite rate.

<sup>2</sup>Nonwhite rate minus white rate.

was smaller than the gap in the *total* employment-to-population ratio in the years before the volunteer force. After that time, the gap was greater in the civilian data. (See table 3.)

Between 1963 and 1982, changes in the composition of the military accounted for roughly 20 percent of the relative decline in the employment-to-population ratio for nonwhite male teenagers;<sup>9</sup> for males ages 20 to 24, the corresponding number is roughly 30 percent. Similarly, changes in the military accounted for 25 percent of the relative increase in unemployment rates for nonwhite teenagers and 40 percent of the relative increase among nonwhites 20 to 24 years of age.

SIGNIFICANT CHANGES in the size and demographic composition of the military have taken place since the start of the all-volunteer Armed Forces in 1973. These changes have also had important implications for the interpretation of labor force statistics. The most significant change is that the share of the military made up by nonwhites grew rapidly in the years after the draft was phased out. Over the same period, the civilian labor market status of nonwhite teenagers and young adults in the civilian labor force deteriorated rapidly. A focus restricted to the civilian labor force, however, yields an exaggerated picture of the extent of this decline. Roughly 30 percent of the relative decline in the number of nonwhite teenagers and young adults in the civilian labor force can be attributed to changes in the demographic composition of the military. □

FOOTNOTES

ACKNOWLEDGMENT: The analysis in this article does not necessarily reflect an official position of the U.S. Department of Labor. The authors

would like to thank their colleagues Roger Hart, Arlene Holen, John Raisian, Eric Sonnett, and Andy Sparks for their helpful comments.

<sup>1</sup>The Bureau has historically published total labor force figures for the overall population, including the military, and made them available for specific age groups.

<sup>2</sup>The last draft call was in December 1972. These men were inducted in 1973, resulting in the positive level of draftees after formal commencement of the volunteer force.

<sup>3</sup>*Statistical Abstract of the United States*, 1982, tables 593 and 596, p. 360.

<sup>4</sup>*Statistical Abstract*, table 594, p. 360.

<sup>5</sup>*Ibid.* In addition to blacks, the category nonwhite includes Asian Americans, American Indians, and others. It should be noted that the "Hispanic origin" category is not a racial classification. Persons in this group may appear in the white or black and other racial categories.

<sup>6</sup>Military Manpower Task Force, November 1982, pp. II-3-II-4.

<sup>7</sup>Recent noteworthy contributions to the research literature on this problem include: John Cogan, "The Decline in Black Teenage Employment, 1950-1970," *The American Economic Review*, September 1982, pp. 621-38; Dave O'Neill, "Racial Differences in Teenage Employment: A Note on the Trends," *Journal of Human Resources*, Spring 1983, pp. 296-306; David T. Ellwood and David A. Wise, *Youth Employment in the Seventies: The Changing Circumstances of Young Adults* (Cambridge, Mass., National Bureau of Economic Research, Inc., 1983), NBER Working Paper Series, 1055. See also the papers collected in Richard B. Freeman and David A. Wise, eds., *The Youth Labor Market Problem: Its Nature, Causes, and Consequences* (Cambridge, Mass., National Bureau of Economic Research, Inc., 1982).

<sup>8</sup>Total employment-to-population ratios are calculated by adding the Armed Forces population to employment and civilian population totals. Total unemployment rates are calculated by including the Armed Forces population in labor force totals.

<sup>9</sup>For example, the growth of the white or nonwhite difference in the total teenage employment-to-population ratio between 1963 and 1982 is 14.1 points (22.9 - 8.8). The corresponding figure for the civilian population is 17.1 points (24.3 - 7.2). Thus, roughly 20 percent of the divergence in the civilian employment-to-population ratio among teenagers can be attributed to changes in the composition of the military. Calculations for other groups are carried out in a similar manner.



# Self-employed workers: an update to 1983

*The number of Americans working for themselves continues to increase, reaching 9.1 million in 1983; they tend to be older than other workers, and although they work longer hours, their earnings are lower*

EUGENE H. BECKER

Even in this age of big business, there are still many individuals who work for themselves. Between 1976 and 1983, the number of self-employed Americans increased each year, posting an overall gain of 23 percent, or 1.7 million.<sup>1</sup> In fact, self-employment among American workers has been increasing for almost a decade and a half, barely pausing for cyclical downturns.

When agricultural self-employment is separated from nonagriculture, two pictures emerge. Agricultural self-employment, which had been decreasing for decades, continued to decline through the mid-1970's. Since 1976, it has held steady at about 1.6 million. Nonagricultural self-employment, in contrast, has increased each year since 1970, when it was 5.2 million, to 1983, when it was 7.6 million, an increase of more than 45 percent.<sup>2</sup>

## Related groups

Several groups are closely related to the self-employed, but are not included in their number. Among them are individuals who have incorporated their own businesses. By incorporation, such persons draw a wage or salary from their business and, consequently, are included among wage and salary workers.<sup>3</sup> The incorporated self-employed accounted for 2.8 million workers in 1982, up from 2.1 million in 1978.

Another group closely related to the self-employed is the unpaid family worker (who must work at least 15 hours a week in a family business to be counted in the statistics). There were slightly more than 600,000 of these workers in 1983. As a worker group, unpaid family members have been declining for several decades. Since 1970, their number in agriculture has dropped by about 52 percent, compared with a 25-percent decline for those in nonagricultural work. (See table 1.)

No typical unpaid family worker exists. He or she may be the spouse of a doctor or dentist doing office chores or professional work, the child of the owner of a small store or business helping out after school and on weekends, or the relative of a family farmer putting in long hours of manual work.<sup>4</sup> More than three-fourths of unpaid family workers were women in 1983, a proportion only slightly smaller than in past years.

Finally, there is the person who holds two jobs and who is self-employed on the second job. Because the Current Population Survey counts each person only once, dual jobholders are classified according to their primary job. The latest available data on multiple jobholders from the May 1980 Current Population Survey show that about 1.6 million people, or one-third of all dual jobholders, were self-employed on their second jobs.<sup>5</sup>

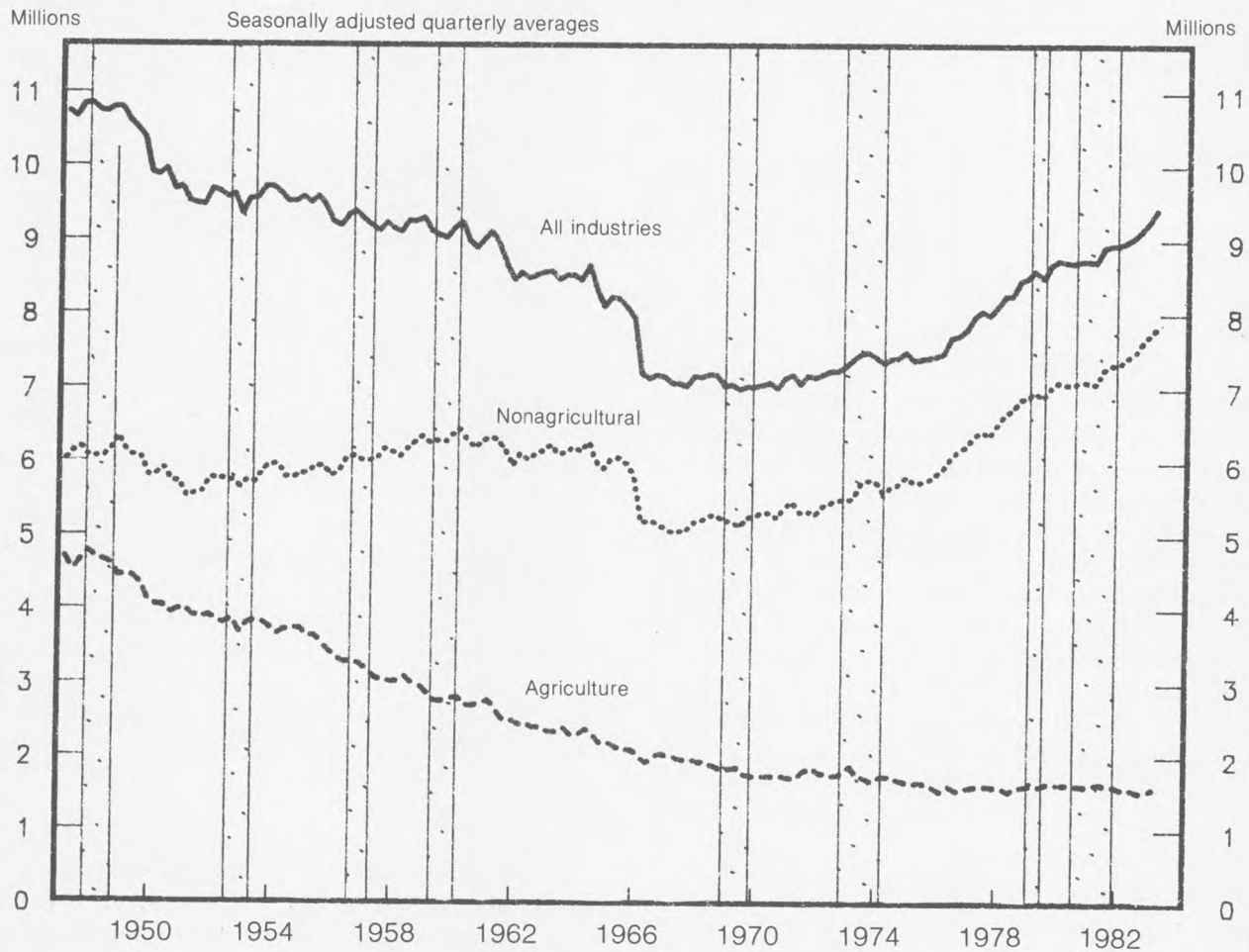
## Cyclical patterns

The upward trend in the number of self-employed workers began around 1970. (See chart 1.) Prior to then, self-em-

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**Chart 1. Self-employed workers by major industry group, 1948-84**



NOTE: Shaded areas denote recessions.

ployment had been on the decline, fueled largely by the reduction in agricultural self-employment, which in 1948 was 4.7 million. Agricultural self-employment continued to decline through the mid-1970's, but at a much slower pace. Since 1976, agricultural self-employment has leveled off at about 1.6 million, suggesting that the decline in independent family farming may be coming to an end.

In the nonagricultural sector, there were 6.1 million self-employed in 1948; by 1970, the number had declined to 5.2 million. Not included in the 1970 total, however, was a large number of incorporated self-employed who, prior to 1967, had been included.<sup>6</sup> Nonfarm self-employment began rising slowly in the early 1970's and more sharply in the second half of the decade. By 1983, the number reached 7.6 million.

Several analysts have suggested that self-employment moves in a countercyclical fashion.<sup>7</sup> While the evidence for this is not overwhelmingly strong, an examination of the

proportional seasonally adjusted quarterly changes in self-employment during recessions tends to support this idea, at least for the nonagricultural sector. The following tabulation shows percentage changes in self-employment from business cycle peaks to troughs (as designated by the National Bureau of Economic Research), 1948-82:

Peak	Trough	All industries	Non-agriculture	Agriculture
IV-1948	IV-1949 . . .	-0.5	4.5	-7.0
III-1953	II-1954 . . .	-.5	-.3	-.8
II-1957	II-1958 . . .	-2.4	-.1	-6.7
II-1960	I-1961 . . .	2.2	2.4	1.8
IV-1969	IV-1970 . . .	.0	1.5	-4.3
IV-1973	IV-1975 . . .	.5	1.7	-2.8
I-1980	III-1980 . . .	.9	.7	1.9
III-1981	IV-1982 . . .	2.5	3.2	-.8

Nonagricultural self-employment has registered strong increases during the recovery part of the cycle since 1970.



**Table 1. Employment by major industry group and class of worker, 1970-83**

Year	Total			Agricultural			Nonagricultural		
	Self-employed	Wage and salary	Unpaid family	Self-employed	Wage and salary	Unpaid family	Self-employed	Wage and salary	Unpaid family
1970	7,031	70,645	1,001	1,810	1,154	499	5,221	69,491	502
1971	7,077	71,286	1,001	1,750	1,166	479	5,327	70,120	522
1972	7,157	74,010	986	1,792	1,225	467	5,365	72,785	519
1973	7,254	76,847	962	1,780	1,267	422	5,474	75,580	540
1974	7,455	78,460	880	1,758	1,366	391	5,697	77,094	489
1975	7,427	77,551	869	1,722	1,301	386	5,705	76,249	483
1976	7,429	80,519	806	1,646	1,344	342	5,783	79,175	464
1977	7,694	83,481	841	1,580	1,360	343	6,114	82,121	498
1978	8,047	87,205	795	1,618	1,452	316	6,429	85,753	479
1979	8,384	89,674	767	1,593	1,451	304	6,791	88,222	463
1980	8,642	89,950	711	1,642	1,425	297	7,000	88,525	413
1981	8,735	91,006	656	1,638	1,464	266	7,097	89,543	390
1982	8,898	89,967	661	1,636	1,505	261	7,262	88,462	401
1983	9,140	91,075	616	1,565	1,579	240	7,575	89,500	376

During downturns, however, it has tended to stabilize or increase moderately after a decline. In effect, nonagricultural self-employment has come out of each of the cyclical downturns since 1970 somewhat earlier than its wage and salary counterpart. One possible reason for this may be the length and intensity of the recessions themselves (except for the 1980 downturn). When persons who are self-employed on their second job lose their primary wage and salary job due to an economic downturn, their self-employment, if continued, becomes their primary job. In addition, some people may enter self-employment upon the loss of a wage and salary job. Self-employment growth during the first full year of recovery from the 1981-82 recession was exceptionally large—360,000, or 4 percent—when compared with other postwar recovery periods.<sup>8</sup>

**Demographic characteristics**

Self-employed workers tend to be older than wage and salary workers. Whereas younger workers rarely have the financial and skill resources needed to start their own businesses, many older workers can marshal these resources either through their own efforts or through access to available credit. In addition, older workers who have retired from wage and salary jobs often become self-employed to supplement their retirement income.

Although the average age of self-employed persons has dropped in recent years, those age 45 and over continue to account for a large share (45 percent) of all self-employed workers. The downtrend in age distribution is more pronounced among the self-employed than among wage and salary workers. The percentages of the total accounted for by each of three age groups are shown in the following:

	1979	1983	Change
<b>Self-employed:</b>			
16-24	6.6	6.1	-0.5
25-44	44.3	48.6	4.3
45 and over	49.0	45.2	-3.8
<b>Wage and salary:</b>			
16-24	24.1	21.3	-2.8
25-44	45.9	50.5	4.6
45 and over	30.0	28.2	-1.8

Blacks are considerably less likely than the population at large to be self-employed. While this was true in 1979, it was even more so in 1983, as the proportion of self-employed blacks dropped from 5.5 to 3.8 percent. At the same time, their number declined by more than 100,000, or 23 percent, while that of their wage and salary counterparts increased by 30 percent.

Not only are there proportionately fewer black self-employed workers, but those who did operate their own businesses in 1983 were quite likely to be in sales, service, farming, and operator, fabricator and laborer occupations. White self-employed workers, in contrast, were more likely to be in managerial and professional and technical occupations.

In addition to being disproportionately older and white, 71 percent of the self-employed in 1983 were men, compared with 55 percent of wage and salary workers. But the number of self-employed women has increased five times faster than the number of self-employed men, and more than three times as fast as wage and salary women. To the extent that the total female labor force is growing more rapidly than the male labor force, the increase in self-employed women is to be expected. Nevertheless, the continued increase in the number of self-employed women may also

**Table 2. Occupational distribution by class of worker, 1983**

[In percent]

Occupation	Self-employed workers	Wage and salary workers	Unpaid family workers
Total	100.0	100.0	100.0
Managerial and professional speciality	26.7	23.2	4.7
Technical, sales, and administrative support	23.1	31.7	43.8
Service	9.7	14.2	6.5
Precision production, craft, and repair	16.7	11.8	3.1
Operator, fabricator, and laborer	6.6	17.0	6.3
Farming, forestry, and fishing	17.3	2.1	35.7

NOTE: Columns may not equal total because of rounding.

indicate an expansion in the employment opportunities women are creating for themselves.

### Occupational and industry distribution

As with wage and salary workers, the self-employed are widely distributed across occupations and, with two major exceptions, their distribution patterns are similar. (See table 2.) A much larger share of self-employed than wage and salary workers are in agriculture. This phenomenon traces its roots to the family farm. However, with the advent of large-scale corporate farming, the family farm and, with it, agricultural self-employment, began to decline. From 4.8 million workers in the fourth quarter of 1948, agricultural self-employment declined to 1.6 million in the fourth quarter of 1983. Nevertheless, agriculture accounted for more than 17 percent of all self-employed workers in 1983, compared with a little more than 2 percent of wage and salary employment. The managerial and professional specialty occupations accounted for more than a quarter of all self-employed workers and was the largest single group among the major occupations. Physicians, dentists, chiropractors, lawyers, and accountants are included in this group.

Technical, sales, and administrative support jobs were only a slightly smaller proportion of self-employment than the managerial and professional specialty occupations, but this proportion was substantially smaller than that of wage and salary workers in the same occupational group. Included in this group are many jobs not readily suited to self-employment, such as cashiers, receptionists, and bank tellers.

Self-employment does constitute a lion's share of several occupations. More than half of all dentists, veterinarians, optometrists, podiatrists, and other health diagnosing technicians, authors, painters and sculptors, auctioneers, street and door-to-door sales workers, barbers, child-care workers, and farm operators and managers were self-employed in 1983.

Just as certain occupations lend themselves to self-employment, so do certain industries. More than half of the workers in dressmaking shops, shoe repair shops, barber shops, and lodging places other than hotels or motels were self-employed. Other industries with more than a quarter of their work force self-employed included: taxicab service, business management and consulting services, auto repair shops, and beauty shops.

Clearly, the service-producing sector provides the bulk of the opportunities for self-employment outside of agriculture. Eighty percent of the self-employed had service-producing jobs, compared with 70 percent of wage-and-salary workers. While most of the self-employed in this sector had jobs in retail trade or services, this was due to the dominance of these two industries in terms of total employment. Only about 10 percent of the work force in both retail trade and services were self-employed, not much higher than the percent of total nonagricultural employment.

Within the goods-producing sector, almost 20 percent of construction industry employment consisted of the self-em-

**Table 3. Nonagricultural self-employment by industry, selected years**

Industry	Number (in thousands)			Percent		
	1972	1979	1983	1972	1979	1983
Total	5,365	6,791	7,578	100.0	100.0	100.0
Goods-producing	1,003	1,513	1,558	18.7	22.3	20.6
Mining	13	22	29	.2	.3	.4
Construction	746	1,152	1,158	13.9	17.0	15.3
Manufacturing	244	339	371	4.5	5.0	4.9
Service-producing	4,362	5,278	6,020	81.3	77.7	79.4
Transportation, communication, and public utilities	203	276	322	3.8	4.1	4.2
Wholesale trade	213	277	316	4.0	4.1	4.2
Retail trade	1,475	1,576	1,616	27.5	23.2	21.3
Finance, insurance, and real estate	262	445	532	4.9	6.6	7.0
Services	2,209	2,704	3,233	41.2	39.8	42.7

ployed, compared with only 3 percent in mining and 2 percent in manufacturing. The need for extensive capitalization is clearly a major deterrent for the latter two industries.

Growth patterns in the two sectors were quite different over the 1979-83 period than in the prior 7 years, partly because of the impact of the 1980 and 1981-82 recessions on the goods sector. During the 1972-79 period, self-employment in the goods-producing sector grew twice as fast as in the service-producing sector, primarily because of rapid growth in the construction industry and slow growth among retailers. Over the 1979-83 period, employment growth continued to be slower than average among self-employed retailers, but it picked up in the services industry. The latter industry alone provided two-thirds of the 1979-83 increase in the self-employed. Thus, during that period, both self-employment and employment in general grew faster in the service sector than in the goods-producing sector. (See table 3.)

### Hours and earnings

Self-employment conjures up the image of an individual who works many hours each week to keep his or her business operating. And, indeed, almost a third of those working for themselves in nonagricultural jobs worked at least 49 hours a week in 1983. The workweek of the self-employed averaged 40 hours, down nearly 2 hours from 1979. During the same period, the average workweek of wage and salary workers declined by one-half hour, to 38 hours. (See table 4.) Thus, there has been a narrowing in the gap in the workweek between the self-employed and other workers.

**Table 4. Weekly hours of work by major industry group and class of worker, 1979-83**

Industry group and class	1979	1980	1981	1982	1983	Change, 1979-83	
						Hours	Percent
Nonagricultural:							
Self-employed	41.9	41.2	40.5	39.8	40.0	-1.9	-4.5
Wage and salary	38.4	38.1	37.6	37.6	37.9	-.5	-1.3
Agricultural:							
Self-employed	51.4	49.3	49.5	48.3	47.4	-4.0	-7.8
Wage and salary	42.1	41.6	40.9	40.3	40.3	-1.8	-4.3



Self-employed farmers put in more than 47 hours a week in 1983, down from more than 51 hours in 1979. Although they still worked more hours than their nonagricultural counterparts, the same declining trend in hours is evident.

Persons who work for themselves continue to earn less than their wage and salary counterparts. Despite a generally longer workweek, self-employed persons in 1982 earned, on average, only about 70 percent as much as wage and salary workers, that is \$12,595 compared with \$17,559.<sup>9</sup>

Nevertheless, there were a number of occupations—mostly professional—where self-employment was more remunerative than wage and salary work. Included are management-related jobs such as accountants and auditors, records management analysts, buyers, and business promotion agents; and professional specialty occupations such as natural scientists, health diagnosing, assessment, and treating, legal, and certain sales-related jobs.

Partly because more than half of the women who work for themselves were in the relatively low-paying sales and service occupations, their median earnings of \$6,644 in 1982 were substantially below those of self-employed men, who earned \$14,360. (See table 5.) A sizable portion of self-employed men, about a third, were in the more lucrative management and professional specialty occupations or worked as finance and business sales representatives, also a high-paying occupation.

**Table 5. Median earnings of year-round full-time workers in 1982, by occupation, class of worker, and sex**

Occupation	Men		Women	
	Self-employed	Wage and salary	Self-employed	Wage and salary
Total .....	\$14,360	\$21,542	\$6,644	\$13,352
Managerial and professional specialty .....	24,720	28,637	10,366	17,955
Technical, sales, and administrative support .....	15,841	21,694	7,468	12,897
Service .....	10,913	14,632	4,837	9,185
Precision production, craft, and repair .....	13,890	21,432	7,557	14,024
Operator, fabricator, and laborer .....	12,015	17,167	5,918	11,047
Farming, forestry, and fishing .....	6,584	11,323	238	7,958

The 1982 mean earnings of self-employed men were also below those of wage and salary workers, a reversal of the situation in 1978. At that time, earnings of self-employed men were “substantially skewed at the upper end of the earnings distribution,” bringing their mean earnings to a fairly high level.<sup>10</sup> In 1982, however, more than half of all self-employed men had earnings below \$15,000 a year, compared with only a fourth of wage and salary workers. At the upper end of the scale, a fifth of self-employed men had earnings above \$30,000 a year, compared with a fourth of wage and salary men. □

—FOOTNOTES—

<sup>1</sup>This report primarily covers trends since 1979, as it updates T. Scott Fain, “Self-employed Americans: their number has increased,” *Monthly Labor Review*, November 1980, pp. 3–8. It is based on data from the Current Population Survey, a monthly sample survey of about 60,000 households conducted for the Bureau of Labor Statistics by the Census Bureau. Self-employed persons are defined as those who work for profit or fees in their own business, profession, or trade, or operate a farm.

<sup>2</sup>The size of the nonagricultural self-employed class corresponds closely to—but by no means totally explains—the difference between two independently derived estimates of nonagricultural employment. In 1983, the Current Population Survey (household survey) provided an estimate of 97.5 million nonagricultural workers, while the Current Employment Statistics (establishment survey) program produced an estimate of 90.0 million. In addition to the coverage differences, the two surveys differ in terms of both concept and methodology.

<sup>3</sup>In 1967, it became possible to identify workers who had reported themselves in the Current Population Survey as self-employed but who had incorporated their businesses. Practically all of these workers were in the nonagricultural sector and their reclassification out of self-employment in 1967 is quite apparent in the trend line on chart 1. For a more complete discussion of the incorporated self-employed see Fain, “Self-employed Americans.” Also see Robert L. Stein, “New Definitions for Employment and Unemployment,” *Employment and Earnings and Monthly Report on the Labor Force*, February 1967, pp. 3–27.

<sup>4</sup>For a report on unpaid family workers since 1950, see Patricia A. Daly, “Unpaid family workers: long-term decline continues,” *Monthly Labor Review*, October 1982, pp. 3–5.

<sup>5</sup>For additional comments and tabulations on the May 1980 data, see Daniel E. Taylor and Edward S. Sekscenski, “Workers on long schedules, single and multiple jobholders,” *Monthly Labor Review*, May 1982, pp. 51–52.

<sup>6</sup>For a quantification of the effect of moving the incorporated from the self-employment to the wage and salary classification see Stein, “New Definitions,” page 34.

<sup>7</sup>See John E. Bregger, “Self-employment in the United States, 1948–62,” *Monthly Labor Review*, January 1963, pp. 37–43; and Robert N. Ray, “A report on self-employed Americans in 1973,” *Monthly Labor Review*, January 1975, pp. 49–54.

<sup>8</sup>The comparison refers to the 13-month period from November 1982, the trough of the most recent recession, through December 1983. Largely because of the unusually fast growth in self-employment, total employment grew faster than wage and salary employment (as measured by the survey of establishments) during the first year of recovery.

<sup>9</sup>These data are from the March 1983 supplement to the Current Population Survey and refer to 1982 median earnings for year-round full-time workers. These median earnings do not include income implicit to the self-employed worker (and generally not available to the wage and salary worker) such as use of the business car for personal travel or the home as the place of work, or feeding or clothing the family from a store owner’s own stock or the farmer’s own fields.

<sup>10</sup>See Fain, “Self-employed Americans.” The situation is not exactly comparable, however, because Fain’s analysis is based on private wage and salary workers, whereas the earnings data in this report are for all wage and salary workers, including government employees.

# Sources of secular increases in the unemployment rate, 1969–82

*Progressively higher rates of joblessness suggest a strong structural component in today's unemployment; the influx of women and young workers was an important factor early in the study period, while later years show a decline in the employment picture for prime-age men*

MICHAEL PODGURSKY

Since the late 1960's, the unemployment rate at the peak of economic expansions as well as at recession troughs has tended to rise over time. Was this upward drift primarily a result of the inflationary price shocks and macroeconomic turbulence of the 1970's, or were microeconomic labor market forces at work as well? What role did the strains associated with the absorption of a rapidly growing, young, and inexperienced labor force play? And, finally, what contribution did structural unemployment among adults make to this secular rise?

The relative importance of these and other contributing forces are the subject of debate among economists and are clearly of considerable importance for economic policy.<sup>1</sup> If, for example, the rising trend in the unemployment rate stemmed primarily from demographic factors, macroeconomic policy alone—if correctly administered—could reverse the trend in the coming decade as the labor force growth rate slows and the “baby boom” generation matures. However, if structural unemployment among adults was a major contributor, macroeconomic policy alone will not produce unemployment rates comparable with those of the 1960's—a rising economic tide will not raise all labor force boats.

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This article examines in some detail the composition of peak-to-peak and trough-to-trough changes in the unemployment rate over the 1969–82 period. A statistical profile of the labor force segments that nudged the unemployment rate progressively higher over this period can provide some insight as to the relative importance of demographic and other factors in generating the upward trend and help us interpret the labor market experience of the 1970's.<sup>2</sup>

The first part of the article provides a brief discussion of cyclical and noncyclical components of unemployment. Subsequent parts examine demographic, occupational, industrial, and other sources of secular changes in the unemployment rate using data from the Current Population Survey. A concluding part highlights the major trends in the composition of the unemployment rate changes and provides a tentative interpretation of the findings in light of the questions posed above.

## **Cyclical vs. noncyclical unemployment**

Economists typically distinguish two broad components of aggregate unemployment—cyclical and noncyclical. Cyclical unemployment derives from fluctuations in aggregate demand and will decline in the course of an expansion. Noncyclical unemployment is considerably more tenacious, however, and persists even in the face of economic growth.

There are two major sources of noncyclical unemployment. The first is frictional unemployment, which is of a



transitory nature and results from voluntary job turnover and mobility into and out of labor markets. Of more concern from a policy viewpoint is structural unemployment, which arises from more fundamental skill or locational mismatches between supply and demand in the labor market, and is associated with prolonged periods of unemployment, subemployment, and withdrawal from the labor force.<sup>3</sup>

In practice, we cannot precisely estimate changes in these three types of unemployment between any two points in time. Nevertheless, it is possible to minimize the effect of cyclical factors by comparing the level and composition of unemployment during similar phases of business cycles, which is the approach employed in the following sections.

**Secular trends**

The secular rise in the unemployment rate is readily seen in table 1.<sup>4</sup> The unemployment rate at the trough of the 1969–70 recession averaged 5.8 percent of the labor force. It rose to 8.3 percent in the 1973–75 recession, dipped to 7.5 percent during the brief 1980 recession, and then climbed sharply to 10.6 percent during the 1981–82 downturn. The net increase over the 12-year period ended December 1982 thus totaled 4.8 percent of the labor force.

A similar upward trend is apparent in expansion peaks. Starting from 3.6 percent of the labor force at the peak of the long 1961–69 expansion, the unemployment rate climbed by more than a percentage point in each of the next three expansions to reach 7.4 percent by third-quarter 1981. The net 12-year increase in the unemployment rate between the third quarters of 1969 and 1981 amounted to 3.8 percent of the labor force.

**Demographic factors**

Considerable attention has been devoted to demographic factors—in particular, the increased flow of youth and women into the labor force during the 1970’s—as a possible cause of the rising rate of unemployment. To examine the role of demographic shifts in the labor force, trough-to-trough and

peak-to-peak breakdowns of sources of the rising unemployment rate by age and sex are presented in table 2.<sup>5</sup> The first column of the table shows the percentage-point change in the overall unemployment rate, and the remaining columns, the percentage contribution of each demographic group to that change. For example, reading across the first row, we find that youth (ages 16 to 24) accounted for 43.1 percent, or 1.1 percentage points, of the 2.5-percentage-point increase in the unemployment rate between the fourth quarter of 1970 and first quarter 1982. The table also shows the percent of the labor force accounted for by each of the demographic groups at the beginning and end of the 12-year intervals under consideration.

Youth have made a disproportionate and substantial contribution to the secular increase in the rate of unemployment, but their contribution has declined over time. While young workers made up just 21.9 percent of the labor force in fourth-quarter 1970, they accounted for 43.1 percent of the increase in unemployment between the 1970 and 1975 troughs. If we skip over the brief 1980 recession and compare the 1973–75 and 1981–82 recessions, we find that the youth contribution drops to 16 percent. Overall, youth accounted for 29.2 percent of the trough-to-trough increase in the unemployment rate over the 12-year period.

The downward trend in the youth contribution stands out clearly in the peak-to-peak comparisons as well. While making up just over one-fifth of the labor force, they accounted for 58.0 percent of the increase in unemployment between expansion peaks in 1969 and 1973. Their contribution fell sharply to 33.6 percent and 30.5 percent over the 1973–79 and 1979–81 peak-to-peak intervals.

What explains the declining youth contribution? The youth component may be broken down into two parts, one reflecting a rising unemployment rate among youth, and a second stemming from changes in youth’s share of the total labor force. Such a decomposition is presented in table 3. The first column of this table shows the total contribution of youth to the change in the unemployment rate. The next two columns decompose this contribution into a part due to rising unemployment among youth, and part due to changing weight of youth in the labor force. A positive value in the “Weight” column means that the youth labor force was growing faster than the total labor force; hence, its share of the labor force was rising. A negative term indicates a slower relative rate of growth.

A comparison of the second and third columns of table 3 clearly shows that the negative trend in the youth contribution to the overall unemployment rate is attributable to changes in the rate of growth in the number of young workers relative to increase in the adult labor force. Comparing the 1969–70 and 1973–75 recessions, we find that the rising youth share of the labor force by itself accounted for 30.9 percent of the increase in the unemployment rate. Between 1975 and 1982, however, the youth share component was –12.9 percent, meaning that a declining youth share of the

**Table 1. Average unemployment rates at business cycle peaks and troughs, and peak-to-peak and trough-to-trough changes, 1969–82**

Peak quarter	Unemployment rate	Percentage-point change, peak-to-peak	Trough quarter	Unemployment rate	Percentage-point change, trough-to-trough
1969: III . . . .	3.6	—	1970: IV . . . .	5.8	—
1973: III . . . .	4.8	1.2	1975: I . . . . .	8.3	2.5
1979: IV . . . . .	6.0	1.2	1980: III . . . .	7.5	–0.8
1981: III . . . . .	7.4	1.4	1982: IV . . . . .	10.6	3.1
Change, 1969: III to 1981: III . . . .	—	3.8	Change, 1970: IV to 1982: IV . . . .	—	4.8

Source: *Labor Force Statistics Derived from the Current Population Survey: A Databook*, Vol. II, Bulletin 2096 (Bureau of Labor Statistics, 1982); and *Employment and Earnings*, April 1983.

**Table 2. Demographic sources of the rising unemployment rate, 1969–82**

Period	Percentage-point change in the unemployment rate	Percent contribution of group to change in unemployment rate—						
		Total	Age 16 to 24	Age 25 to 54		Age 55 to 64		Age 65 and over
			Both sexes	Men	Women	Men	Women	Both sexes
<b>Trough-to-trough</b>								
1970: IV to 1975: I	2.5	100.0	43.1	27.6	24.6	1.3	3.2	0.2
Percent of 1970: IV labor force	—	100.0	21.9	38.7	22.0	8.5	5.1	3.8
1975: I to 1980: III	-0.8	100.0	65.0	-30.1	26.9	11.8	16.6	9.8
1980: III to 1982: IV	3.1	100.0	24.3	41.8	16.2	7.0	3.0	7.7
1975: I to 1982: IV	2.3	100.0	16.0	56.7	23.6	4.6	.2	-1.1
1970: IV to 1982: IV	4.8	100.0	29.2	42.4	24.1	3.0	1.7	-0.5
Percent of 1982: IV labor force	—	100.0	22.1	36.7	27.5	6.5	4.4	2.7
<b>Peak-to-peak</b>								
1969: III to 1973: III	1.2	100.0	58.0	20.7	16.3	2.2	1.0	1.9
Percent of 1969: III labor force	—	100.0	21.0	39.3	21.9	8.7	5.2	4.0
1973: III to 1979: IV	1.2	100.0	33.6	36.8	31.2	.3	.9	-2.2
1979: IV to 1981: III	1.4	100.0	30.5	40.5	23.1	3.8	2.4	-0.5
1969: III to 1981: III	3.8	100.0	40.3	33.0	23.3	2.6	1.5	-0.2
Percent of 1981: III labor force	—	100.0	23.0	36.4	26.8	6.6	4.4	2.8

NOTE: Due to rounding, sums of individual items may not equal totals.

SOURCE: Seasonally adjusted labor force data are from *Labor Force Statistics*; and *Employment and Earnings*, April 1983. Certain fourth-quarter 1982 labor force data were provided by the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics.

labor force was acting to lower the overall unemployment rate.

The downward trend in the youth weight component also stands out clearly in the peak-to-peak comparisons in the lower portion of the table. The rising youth labor force weight accounted for 19.9 percent of the increase in the unemployment rate between the 1969 and 1973 peaks. The weight contribution fell to 1.6 percent over the 1973–79 interval, and became negative (-8.8 percent) during the final 1979–81 period.

Throughout the 1970's and early 1980's, however, the unemployment rate among youth was increasing sharply, thus producing the large positive effects shown in the second column of table 3. When added to the youth weight effects, these intragroup effects were sufficiently large to produce the positive net youth contributions shown in the first col-

umn, even when the youth weight components were negative.

If the secular rise in the unemployment rate in the early 1970's was primarily a youth unemployment problem, by the late 1970's and early 1980's it was increasingly a prime-age male problem. Prime-age men and women (ages 25–54) accounted for 27.6 percent and 24.6 percent, respectively, of the increase in the unemployment rate between 1970 and 1975, with workers over the age of 55 contributing the remaining 4.7 percent. While the contribution of prime-age women remained relatively stable between 1975 and 1982, the prime-age male contribution rose sharply. Although prime-age men made up just 36.7 percent of the 1982 labor force, they had accounted for 56.7 percent of the increase in the unemployment rate between 1975 and 1982.

Peak-to-peak comparisons also show a rising contribution by prime-age men. Their share of the unemployment rate increase grew from 20.7 percent over the 1969–73 interval to 36.8 percent and 40.5 percent during the 1973–79 and 1979–81 peak-to-peak intervals.

In sum, the demographic sources of the secular rise in the unemployment rate have not been constant. Youth made the largest and most disproportionate contribution in the early 1970's. As the surge of young entrants into the labor force abated in the late 1970's and early 1980's, however, the youth contribution declined sharply. Prime-age women have made a substantial but not disproportionate contribution to the increase, and while their share of the labor force rose, their contribution to the rising rate of unemployment did not. The decline in the youth contribution was matched by an equally sharp rise in the contribution of prime-age

**Table 3. Contribution of youth to rising noncyclical unemployment, 1969–82**

Period	Percent contribution—		
	Total	Due to rising youth unemployment	Due to changing youth labor force weight
<b>Trough-to-trough</b>			
1970: IV to 1975: I	43.1	12.2	30.9
1975: I to 1980: III	65.0	46.6	18.4
1980: III to 1982: IV	24.3	31.4	-7.1
1975: I to 1982: IV	16.0	28.9	-12.9
1970: IV to 1982: IV	29.2	28.6	.6
<b>Peak-to-peak</b>			
1969: III to 1973: III	58.0	38.1	19.9
1973: III to 1979: IV	33.6	32.0	1.6
1979: IV to 1981: III	30.5	39.3	-8.8
1969: III to 1981: III	40.3	35.9	4.5



**Table 4. Change in the unemployment rate by reason for unemployment, 1969–82**

Period	Percentage-point change in the unemployment rate	Percent contribution by—				
		Total	Job losers	Job leavers	Re-entrants	New entrants
<b>Trough-to-trough</b>						
1970: IV to 1975: I	2.5	100.0	72.5	5.6	14.5	7.4
1975: I to 1980: III	-0.8	100.0	63.1	1.1	36.4	-0.6
1980: III to 1982: IV	3.1	100.0	79.8	-3.7	14.1	9.7
1975: I to 1982: IV	2.3	100.0	82.3	-4.4	10.8	11.3
1970: IV to 1982: IV	4.8	100.0	77.8	.2	12.5	9.5
<b>Peak-to-peak</b>						
1969: III to 1973: III	1.2	100.0	50.7	15.4	21.4	12.3
1973: III to 1979: IV	1.2	100.0	71.6	4.9	17.5	6.0
1979: IV to 1981: III	1.4	100.0	77.6	1.9	13.0	7.6
1969: III to 1981: III	3.8	100.0	67.2	7.1	17.1	8.6

NOTE: Due to rounding, sums of individual items may not equal totals.

men, who, by the late 1970's, had replaced young workers as the most important factor in secular growth in the unemployment rate.

### Reasons for unemployment

How did workers contributing to the 12-year rise in the unemployment rate become unemployed? The Bureau of Labor Statistics classifies unemployed workers according to four mutually exclusive categories: job losers; job leavers; new entrants; and reentrants. This allows us to decompose the secular rise in the unemployment rate by reasons for unemployment, and in so doing, gauge the importance of involuntary job loss in explaining the upward trend.

Table 4 is similar to table 2, except that changes in the unemployment rate are decomposed by reason for unemployment rather than by demographic characteristics. Both the peak-to-peak and trough-to-trough measures suggest that

the preponderant reason for the rising unemployment rate was involuntary job loss. Job losers accounted for 77.8 percent of the increase in the unemployment rate between the 1970 and 1982 recession troughs, and 67.2 percent of the increase between the 1969 and 1981 expansion peaks.

Involuntary job loss has also tended to increase in importance over time. Job losers accounted for 72.5 percent of the increase in the unemployment rate between the 1970 and 1975 recession troughs. However, their share increased to 82.3 percent between 1975 and 1982. An upward trend also emerges in peak-to-peak comparisons. Job losers accounted for 50.7 percent of the increase in the unemployment rate between the 1969 and 1973 peaks, but this proportion rose to 71.6 percent and 77.6 percent, respectively, over the 1973–79 and 1979–81 peak-to-peak intervals.

Voluntary job leavers, by contrast, have played a small and declining role in the secular rise in the unemployment rate. Job leavers accounted for 5.6 percent of the increase in the unemployment rate between 1970 and 1975, but made a negative contribution (-4.4 percent) to the change between the 1975 and 1982 recession troughs.<sup>6</sup> The contribution of voluntary job leavers to peak-to-peak increases in the unemployment rate is somewhat larger, but the negative trend is even more pronounced. Job leavers accounted for 15.4 percent of the increase between the 1969 and 1973 peaks, but only 1.9 percent of the increase from 1979 to 1981.

Reentrants and new entrants, many of whom are youth and women, have made a notable contribution to the changes in the unemployment rate. Reentrants and new entrants accounted for 14.5 percent and 7.4 percent, respectively, of the increase in the unemployment rate between the 1970 and 1975 troughs. The reentrants' share fell slightly to 10.8 percent over the 1975–82 interval, while the new entrant share rose to 11.3 percent. The combined contribution of

**Table 5. Occupational sources of the rising unemployment rate, 1969–82**

Period	Percentage-point change in unemployment rate	Percent contribution by—									
		White-collar					Blue-collar			Service	
		Total	Professional	Managerial	Sales	Clerical	Total	Craftworkers	Operatives	Laborers	Total
<b>Trough-to-trough</b>											
1970: IV to 1975: I	2.5	22.5	4.0	5.0	2.6	10.9	50.8	17.1	23.6	10.1	14.7
Percent of 1970: IV labor force	—	47.3	13.7	10.2	6.2	17.2	35.7	12.8	17.9	5.0	12.5
1975: I to 1980: III	-0.8	38.3	6.4	2.3	15.6	14.0	40.9	5.6	31.5	3.8	24.9
1980: III to 1982: IV	3.1	28.6	6.7	5.2	4.6	12.1	42.8	15.2	19.6	8.0	21.1
1975: I to 1982: IV	2.3	26.0	6.7	5.8	1.9	11.6	43.3	17.6	16.7	9.0	20.1
1970: IV to 1982: IV	4.8	24.5	5.4	5.5	2.3	11.3	47.0	17.3	20.2	9.5	17.4
Percent of 1982: IV labor force	—	51.3	16.0	11.0	6.4	17.9	31.0	12.3	13.6	5.1	14.0
<b>Peak-to-peak</b>											
1969: III to 1973: III	1.2	30.6	8.4	3.5	4.5	14.2	43.6	20.3	14.1	9.2	17.3
Percent of 1969: III labor force	—	46.6	13.4	9.9	6.0	17.3	36.5	12.9	18.8	4.8	12.3
1973: III to 1979: IV	1.2	23.8	6.7	7.3	.4	9.4	48.4	11.2	24.5	12.7	14.7
1979: IV to 1981: III	1.4	28.4	3.7	5.4	4.7	14.6	44.7	19.1	18.0	7.6	17.2
1969: III to 1981: III	3.8	27.6	6.1	5.3	3.3	12.9	45.5	17.3	18.6	9.6	16.5
Percent of 1981: III labor force	—	50.7	15.6	10.9	6.2	18.0	27.6	12.6	14.5	5.0	13.5

NOTE: The sum of white-collar, blue-collar, and service contributions represents the contribution of experienced civilian workers to the percentage-point change in the unemployment rate and is therefore less than 100 percent, the difference being the contribution of unemployed workers lacking civilian work experience.

**Table 6. Industrial sources of the rising unemployment rate, 1969–82**

Period	Percentage-point change in the unemployment rate	Percent contribution by—							
		Agriculture	Construction	Mining	Manufacturing	Transportation and public utilities	Retail trade	Finance and services	Government
<b>Trough-to-trough</b>									
1970: IV to 1975: I .....	2.5	0.9	10.8	0.8	28.2	4.0	19.3	13.4	8.1
Percent of 1970: IV labor force .....	—	1.5	4.7	.6	25.6	5.5	16.8	19.3	15.5
1975: I to 1980: III .....	-0.8	-3.2	2.0	-5.5	77.6	.1	19.0	5.1	-9.4
1980: III to 1982: IV .....	3.1	2.7	9.0	3.7	29.8	4.0	20.5	18.4	3.0
1975: I to 1982: IV .....	2.3	4.1	10.7	5.9	18.1	5.0	20.9	21.6	6.0
1970: IV to 1982: IV .....	4.8	2.5	10.7	3.3	23.2	4.5	20.1	17.5	7.1
Percent of 1982: IV labor force .....	—	1.7	4.7	1.0	20.2	5.2	18.9	23.8	14.7
<b>Peak-to-peak</b>									
1969: III to 1973: III .....	1.2	-0.2	13.1	.2	12.6	2.7	28.9	17.6	12.1
Percent of 1969: III labor force .....	—	1.5	4.6	.6	26.8	5.6	16.1	18.9	15.1
1973: III to 1979: IV .....	1.2	5.0	7.7	2.3	28.5	6.5	11.4	18.0	13.4
1979: IV to 1981: III .....	1.4	1.4	15.9	1.6	16.9	.8	23.8	19.5	6.6
1969: III to 1981: III .....	3.8	2.0	12.5	1.3	19.1	3.1	21.7	18.4	10.5
Percent of 1981: III labor force .....	—	1.5	4.8	1.1	21.3	5.3	18.5	22.7	15.0

NOTE: Because data are for experienced private wage and salary workers only, industry detail does not sum to 100 percent.

the two groups, however, remained fairly stable.

Thus, involuntary job loss has been the major source of the secular rise in the rate of unemployment. Moreover, it has tended to increase in importance over time. New entrants and reentrants have also played an important role, with a combined contribution of 20 to 30 percent, while voluntary job turnover has played a very small and declining role.

### Occupation and industry

To what extent is the secular increase in the unemployment rate associated with particular occupations or industries? In table 5, the increase in the unemployment rate is decomposed by broad occupational classes. White-collar workers, who made up 51.3 percent of the labor force in fourth-quarter 1982, accounted for 24.5 percent of the increase in the unemployment rate between the 1970 and 1982 recession troughs. Service workers were 14.0 percent of the 1982 labor force, but accounted for a slightly larger 17.4 percent of the increase in the unemployment rate. The group bearing the largest and most disproportionate share of the increased rate of unemployment, however, was blue-collar workers. By fourth-quarter 1982, their share of the labor force had declined to 31.0 percent, but they accounted for 47.0 percent of the increase in the unemployment rate over the 12-year interval.

Broadly similar results obtain in examining peak-to-peak changes in the unemployment rate. White-collar workers made up a slightly larger 27.6 percent of the increase in the rate between the third quarters of 1969 and 1981. The blue-collar and service contributions were slightly smaller—45.5 and 16.5 percent, respectively.

An industrial decomposition of the changing unemployment rate is presented in table 6. Workers in mining, man-

ufacturing, and construction together accounted for 25.9 percent of the labor force in fourth-quarter 1982, but contributed 37.2 percent of the 12-year increase in the unemployment rate. Those in retail trade, finance, and services made up 42.7 percent of the 1982 labor force, and 37.6 percent of the secular change in the unemployment rate. Government workers accounted for 14.7 and 7.1 percent of the labor force and the change in the unemployment rate, respectively.

Peak-to-peak comparisons yield broadly similar results. Over the 12-year interval from third-quarter 1969 to third-quarter 1981, mining, manufacturing, and construction accounted for a somewhat smaller 32.9 percent of the increase in the unemployment rate. The contribution of retail trade, finance, and services was also slightly less (40.1 percent), while government's share remained virtually unchanged at 15.0 percent.

### The duration of unemployment

To what extent is the secular increase in the rate of unemployment associated with long-term unemployment? Has there been a substantial increase in "hard-core" long-term unemployment, or does the higher unemployment rate simply result from a greater frequency of short spells of unemployment? A secular rise in the unemployment rate generated by unemployment spells of progressively longer duration may, for example, signal increasing structural unemployment problems in the labor market.

The average unemployment rate in any quarter is the product of: a) the percent of the labor force experiencing a spell of unemployment (*I*); b) the average number of spells per unemployed worker (*N*); and c) the average duration of an unemployment spell in weeks as a fraction of a quarter



**Table 7. The contribution of unemployment duration to the rising unemployment rate, 1969–82**

Period	Unemployment rate		Unemployment duration	
	Rate	Index	Mean weeks	Index
<b>Trough quarter</b>				
1970: IV .....	5.8	100	9.3	100
1975: I .....	8.3	143	16.2	174
1980: III .....	7.5	129	13.4	144
1982: IV .....	10.6	183	17.5	188
Change, 1970: IV to 1982: IV	4.8	83	8.2	88
<b>Peak quarter</b>				
1969: III .....	3.6	100	7.9	100
1973: III .....	4.8	133	9.6	122
1979: IV .....	6.0	167	10.6	134
1981: III .....	7.4	206	14.0	177
Change, 1969: III to 1981: III	3.8	106	6.1	77

year ( $D/I$ ):

$$(1) \quad u = I N (D/I)$$

Taking the natural log of both sides of equation (1) and differentiating with respect to time yields:

$$(2) \quad \dot{u} = \dot{I} + \dot{N} + \dot{D}$$

where the dotted variables denote proportionate rates of change. Thus, the proportionate contribution of duration to a change in the unemployment rate is  $(\dot{D}/\dot{u})$ .<sup>7</sup>

Unfortunately, data are not available on the average duration of a completed spell of unemployment. However, there are estimates of the average duration of unemployment among workers who are currently unemployed—that is, the average duration of an unemployment spell in progress. There is considerable debate as to whether the latter statistic overstates or understates the average duration of a completed unemployment spell.<sup>8</sup> For our purposes, however, the direction of a bias is irrelevant, so long as the bias remained a relatively stable fraction of the true value during the last 12 years. If this is the case, then proportionate increases in the duration of unemployment in progress imply equivalent increases in the duration of completed unemployment spells.

Table 7 presents proportionate changes in the unemployment rate and the duration of unemployment. Over the 12 years between the 1970 and 1982 troughs, the unemployment rate rose by 83 percent. Over the same interval, the

average duration of unemployment increased by 88 percent, from 9.3 to 17.5 weeks. Thus, extended unemployment duration would seem to account for the entire increase in the unemployment rate over the period. Over the peak-to-peak interval from 1969 to 1981, the unemployment rate and duration rose by 106 percent and 77 percent, respectively. Extended duration thus accounted for approximately 70 percent of the peak-to-peak increase in the unemployment rate.

The evidence in table 7 suggests that the secular increase in the unemployment rate is not due to a larger fraction of the labor force experiencing relatively brief spells of unemployment, but rather to a relatively stable fraction of the labor force experiencing substantially longer periods of unemployment.

WHAT DOES THIS STATISTICAL portrait tell us about the rising unemployment rate? Clearly, frictional, and perhaps structural, factors associated with the increased flow of youth and women into the labor force during the study period did contribute to the higher unemployment rate. Youth accounted for a large and disproportionate share of the increase in the unemployment rate at the beginning of the period, while new entrants and reentrants to the labor force made a steady contribution of 20 to 30 percent in peak-to-peak and trough-to-trough increases in the unemployment rate.

The large contribution of prime-age men, blue-collar workers, and job losers, as well as the sharp increase in the duration of unemployment, suggest that rising structural unemployment in traditional segments of the labor force may also have played a significant role. This composition of rising unemployment is also consistent with higher cyclical unemployment, however, if aggregate demand became progressively more slack between peaks and between troughs over the study period. The across-the-board industrial and occupational contributions to the rising unemployment rate certainly suggest a slackening of aggregate demand. But whatever the exact mix of structural and cyclical factors, the secular rise in the unemployment rate since 1969 seems to have been generated by more than just labor market adjustment problems associated with a rapidly growing labor force. □

—FOOTNOTES—

<sup>1</sup>Recent studies which have examined the unemployment experience during the 1970's include: Martin Neil Baily, ed., *Workers, Jobs and Inflation* (Washington, The Brookings Institution, 1982); James L. Medoff, "Imbalance, Wage Growth and Productivity in the 1970's," *Brookings Papers on Economic Activity*, vol. 1, 1983, pp. 87–128; David M. Lilien, "Sectoral Shifts and Cyclical Unemployment," *Journal of Political Economy*, August 1982, pp. 777–93; and Robert W. Bednarzik, "Layoffs and permanent job loss: workers' traits and cyclical patterns," *Monthly Labor Review*, September 1983, pp. 3–12.

<sup>2</sup>Because the focus of this article is on changes in the structure of unemployment during the 1970's and early 1980's, the period of analysis begins with the expansion peak in the third quarter of 1969. It might be argued, however, that the unemployment rate in the late 1960's was ar-

tificially low due to the Vietnam War. As is shown below, the secular upward trend in the unemployment rate remains whether one begins with the 1969 or 1973 peak, or the 1970 trough. In any event, the long interval between 1969 and 1982 will be broken into peak-to-peak and trough-to-trough subintervals, thus providing a moving benchmark for the analysis.

<sup>3</sup>A third source of noncyclical unemployment is seasonal unemployment, which, as the name suggests, is associated with regular seasonal labor market adjustments. Examples include youth entry into the labor force in May and withdrawal in August, and winter layoffs in construction. Because this study uses only seasonally adjusted labor force data, the effect of such factors has been minimized.

<sup>4</sup>In this article, the term "secular" rather than "noncyclical" is used to denote peak-to-peak or trough-to-trough changes in the unemployment

rate because it is possible that such changes include a cyclical component, if the state of aggregate demand differs from one peak or trough to another.

<sup>5</sup>In computing the sources of rising unemployment, the following identity was used:

$$(u_2 - u_1) = \sum_i \theta_{i2}(u_{i2} - u_{i1}) + \sum_i u_{i1}(\theta_{i2} - \theta_{i1})$$

where  $\theta_i$  and  $u_i$  denote the labor force weight and unemployment rate of the  $i$ th group. The proportionate contribution of the  $i$ th group to the change in the unemployment rate is:

$$\frac{\theta_{i2}(u_{i2} - u_{i1})}{(u_2 - u_1)} + \frac{u_{i1}(\theta_{i2} - \theta_{i1})}{(u_2 - u_1)}$$

The first term is the effect of a changing intragroup unemployment rate, and the second term, the effect of shifting labor force weights.

<sup>6</sup>A negative contribution implies that unemployed job leavers as a percent of the labor force fell between the 1973-75 and 1981-82 recessions. In fact, the absolute number of voluntary job leavers fell over this period—from 902,000 (1975) to 808,000 (1982).

<sup>7</sup>Equation (1) is best understood by considering a simple example. Suppose the average unemployment rate in a quarter is 10 percent and the labor force is 100 million. This means there are 130 million weeks of unemployment to be distributed among the labor force. If 10 percent of the labor force experiences one spell of unemployment during the quarter, then the average duration of the spell must be 13 weeks. If 20 percent of the population experiences one spell, the average duration must be 6.5 weeks. For further discussion, see Richard B. Freeman, *Labor Economics*, 2nd Ed. (Englewood Cliffs, New Jersey, Prentice-Hall, 1979), pp. 112-14.

<sup>8</sup>Because every unemployed worker's *completed* duration of unemployment will at least be as long as his or her *in-progress* duration at the time of the Current Population Survey interview, average in-progress duration will *underestimate* average completed duration. On the other hand, the tendency to "oversample" long-term unemployed will impart a bias in the opposite direction. For example, over the course of a year, a worker unemployed for 6 months will be six times as likely to be sampled as a worker unemployed for 1 month. A lively literature has developed around these matters, much of which is cited in Norman Bowers, "Probing the issues of unemployment duration," *Monthly Labor Review*, July 1980, pp. 23-32.

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### Geoffrey Moore wins Shiskin Award

The fifth annual Julius Shiskin Award for Economic Statistics was presented June 12, 1984 to Dr. Geoffrey H. Moore "for his research in measurement and analysis of business cycles." The award was presented at the Washington Statistical Society Annual Dinner along with an honorarium of \$250.

The Award Program is designed to honor unusually original and important contributions in the development of economic statistics or in the use of economic statistics in interpreting the economy. Participating organizations in the program are the Bureau of Labor Statistics, Bureau of Census, Bureau of Economic Analysis, Office of Federal Statistical Policy and Standards, National Bureau of Economic Research, National Association of Business Economists, and the Washington Statistical Society, all of which Mr. Shiskin was associated with in his long and fruitful career.

Previous winners of the Award were Estella Dagum of Statistics Canada, James Bonnen for his work chairing the President's Reorganization Project for the Federal Statistical System, Edward Denison for his work at the Bureau of Economic Analysis and the Brookings Institution, and Beatrice Vaccara for her contributions at the Bureau of Industrial Economics.

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# Modeling the retirement process for policy evaluation and research

*A sizable minority of men who retire continue to work part time, although the duration of partial retirement tends to be brief; a small number actually increase hours of work after a period of retirement or semiretirement when personal or economic circumstances change*

ALAN L. GUSTMAN AND THOMAS L. STEINMEIER

The economics literature has generally conceived of the retirement process as a one-way flow from an "in the labor force" status to a "not in the labor force" status. However, evidence from recent studies suggests that the retirement transition is much more complex, involving both major flows from full-time work to full retirement, either directly or indirectly through partial retirement, and much smaller flows in the opposite direction. Information about these flows provides a richer description of the retirement process. It may also help in establishing values for parameters which are important to the retirement decision and, thereby, in understanding the nature of that decision.

This article presents an analytical framework for investigating transitions of white men among full-time work, partial retirement, and full retirement. Of special importance are flows to partial retirement, which usually are associated with a reduction in wage rates and frequently entail a change in employers as well. Various descriptive statistics related to the retirement process, including probabilities of older workers being in particular labor force states at given ages, transition rates among the various states, and continuation

rates in the states, also are examined. A final section discusses implications of the descriptive statistics for the estimation of retirement models.

## The analytical framework

The framework for this analysis reflects a number of relevant findings presented in our previous work. One such finding is that partial retirement is indeed a widespread phenomenon.<sup>1</sup> Between the ages of 65 and 69, partial retirement is as common as continued full-time work.<sup>2</sup> More than one-third of the older white men who were not self-employed in the Social Security Administration's Retirement History Survey indicated that, during at least 1 of the 4 sample years between 1969 and 1975, they were partially retired.<sup>3</sup> Moreover, the probability of partial retirement remained high even for those who were in good health, did not face mandatory retirement, and were not covered by a pension.

A second important finding is that partially retired workers had significantly lower wage rates than comparable full-time workers.<sup>4</sup> These lower wage rates may come about for at least two reasons. First, surveys of both workers and firms indicate that, in a majority of jobs, an individual is not permitted to cut back from full-time to part-time work.<sup>5</sup> Under such circumstances, if an older worker wishes to reduce his work effort below full time, he must quit his main job and find one that does permit part-time work,

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usually at a lower wage rate. In some cases, the worker can reduce his hours of work without changing jobs, albeit at a reduction in the wage. As would be expected, the relatively small fraction of individuals who are free to reduce hours of work on their main job are overrepresented among those who do partially retire.<sup>6</sup>

These findings may be incorporated into a formal life-cycle model as follows. An individual is presumed to choose a time path for consumption and labor supply so as to maximize lifetime utility:

$$(1) \quad U = \int_0^T u[C(t), L(t), t; \beta] dt$$

where  $C(t)$  is consumption at time  $t$ ,  $L(t)$  is leisure at time  $t$ , and  $\beta$  is a vector of parameters that determine the nature of the utility function  $u$  at any time  $t$ . The maximization of the utility function is subject to the lifetime budget constraint:<sup>7</sup>

$$(2) \quad \int_0^T d(t) \{W_N[H_N(t), t] + W_P[H_P(t), t]\} dt + A_0 = \int_0^T d(t) C(t) dt$$

where  $d(t)$  is the discount factor to time  $t$ ;  $W_N[H_N(t), t]$  is the total compensation, including changes in pension and social security asset values, from working  $H_N(t)$  in the nonretirement job;  $W_P[H_P(t), t]$  is the corresponding compensation for  $H_P(t)$  hours in the partial retirement job; and  $A_0$  is the discounted value of the individual's exogenous assets.<sup>8</sup> Further constraints limit the potential quantities of labor supply and relate labor supply to leisure:

$$(3) \quad H_N(t) [h_N - H_N(t)] = 0$$

$$(4) \quad 0 \leq H_P(t) \leq h_N$$

$$(5) \quad H_N(t) H_P(t) = 0$$

$$(6) \quad L(t) = 1 - H_N(t) - H_P(t) \geq 0$$

The first constraint specifies that the individual must work either full time (where full-time work is a fraction,  $h_N$ , of available time) or not at all in the nonretirement job, while the second specifies that the labor supplied to the partial retirement job can range between none and full time.<sup>9</sup> The third constraint specifies that the individual cannot work at both jobs simultaneously, and the last constraint defines leisure as the time not supplied as labor.

Within the context of this model, the paths of wages in the two types of jobs (that is, tenure dependence) will induce bunching of hours. Most people will spend the first part of their working lives in nonretirement jobs, where the wage rate is higher than in partial retirement jobs. With increasing age, however, the individual's utility function is likely to change in such a manner that full-time work generates increasing disutility to the point that he will quit the nonretirement job. Some people will find it advantageous to

spend additional years in part-time employment, albeit at a lower wage rate, while others will elect to bypass the stage of partial retirement entirely and move directly to full retirement. Even for those who partially retire, the within-period utility function will continue to shift over time to make work increasingly onerous, so that these people, too, will eventually wish to retire fully. Hence, the sequence that we expect to find most often is nonretirement, possibly followed by partial retirement, followed by full retirement.

It is possible that some people will find it desirable or necessary to move in the reverse direction from the sequence indicated above. That is, they may work in a partial retirement job after being fully retired, or they may take a nonretirement job after being partially or fully retired. Such "reverse" flows may be generated by very substantial jumps in wage rates in an individual's later years, but this is not a very persuasive reason for many such flows. A more plausible explanation involves unexpected changes in a person's economic or social circumstances that induce him to change his mind and return to work for a period during which he had anticipated being partially or fully retired. For example, an individual might suffer large losses in the financial markets, and subsequently find he has fewer assets than anticipated. His spouse might suffer from a serious illness or injury which increases the household's need for income. Alternatively, he may retire and then find that he does not enjoy his new status. Any of these circumstances could lead the individual to recalculate the optimal path of labor supply over his remaining lifetime, causing him to move in the reverse direction from the typical nonretirement-to-retirement sequence.

### Descriptive statistics on retirement flows

Statistical evidence bearing on the magnitudes of the labor force flows associated with the model described above is available from the Retirement History Survey. Survey data used in this study pertain only to white men who had not been self-employed before retirement, for the years 1969, 1971, 1973, and 1975. Respondents included in the sample were 58 to 63 years old in 1969.

So that a meaningful number of observations could be obtained for each cell, some of the tables in this article do not distinguish among different cohorts in survey years. In such cases, the entry for a particular cell mixes observations at different points in time and for different cohorts. There are two problems with this procedure which the reader should bear in mind. First, the unemployment rate differed widely among the four survey years, ranging from 3.5 percent in 1969 to 8.5 percent in 1975. Second, there have been downward trends in male labor force participation rates—since 1900 for those over 65, and since the late 1960's for those 55 to 64.<sup>10</sup> These trends could possibly be caused by secular changes in many of the explanatory variables included in the life-cycle model we describe, but might also reflect true cohort effects. When the observations are pooled, these



differences are either hidden or, where the focus is on calendar age, may be correlated to some extent with the age variable.

*State probabilities.* First, the simple percentages of the sample who were not retired, were partially retired, or were fully retired were examined. Table 1 presents these percentages by survey year and by age of the respondent.<sup>11</sup> Three aspects of this table are particularly noteworthy.

First, departure from the nonretirement state is indeed pervasive between the ages of 58 and 68. The percentage of individuals reporting in a particular survey that they were not retired at all falls from 85 percent to 8 percent during this 10-year span. This is accompanied by a very large increase in the fraction of the sample who were fully retired, and a smaller rise in the portion who were partially retired.

Second, among those who worked at all, partial retirement was more common than nonretirement for individuals past the age of 65. For the 5-year span beginning at age 65 and ending at age 69, the fraction of individuals who were partially retired holds fairly steady between 15 and 20 percent. During the same period, nonretirement falls from around 20 percent to a little more than 5 percent. These figures again suggest that partial retirement is an important phenomenon, particularly in the older age ranges.

Finally, there appear to be unmistakable trends in the proportions of the men not retired and fully retired. Between 1969 and 1973, the percentage of 62- and 63-year-olds not retired dropped by 8 to 9 percentage points, and similar declines are observed for 64- and 65-year-olds between 1971 and 1975. The figures for full retirement display an equally large change in the opposite direction. What is not clear from the table is whether there are similarly strong changes for men under 62 or over 65, for whom the 1969-75 Retirement History Survey includes data from at most two adjacent surveys. These data give some hint of such changes for those cohorts, but they do not appear to be as strong as for the 62- to 65-year-old group.

*Transition rates among retirement states.* Table 2 presents the entry and exit rates among the various retirement states.<sup>12</sup>

The top panel of the table indicates entry rates from specific states 2 years earlier. For example, of the people who were partially retired, 44.1 percent had been not retired 2 years earlier, 40.0 percent had been partially retired, and so on. Note that the rows of this panel sum to 1. The bottom panel of the table conveys the same kind of information on exit rates to specific states 2 years later. For instance, of the people who were not retired as of a particular survey, 10.5 percent were partially retired by the next survey, and 26.8 percent were fully retired. The columns of the bottom panel sum to 1.

Three features of this table are of particular interest. First, consider the exit rates from nonretirement. About 37.3 percent of the individuals who were not retired in one survey were either partially or fully retired by the time of the next survey 2 years later. Of those who left nonretirement and did not become unemployed, 28.2 percent (calculated as  $.105/.373$ ) partially retired, and the remaining 71.8 percent fully retired. Again, these figures underscore the fact that partial retirement is a phenomenon that affects a significant fraction of the labor force during their later years.

The exit rates for partially retired workers also bear mention. There was only a 48.5-percent chance that an individual who was partially retired during one survey would still be partially retired 2 years later. If exit from partial retirement were a random process with a constant hazard rate, this would imply that the average duration of partial retirement is a little under 3 years.<sup>13</sup> The assumption of a constant hazard rate is undoubtedly an oversimplification, but the findings nevertheless suggest that the duration of partial retirement is quite short, particularly when compared to the duration of an individual's full-time work.

A third interesting feature of the table involves the flows against the normal retirement paths. We noted earlier that, in some cases with unusual wage paths, or in cases where the individual encounters unforeseen events, it is possible that he might move in a direction counter to the predominant retirement path. Table 2 indicates that this does indeed occur. More specifically, of the people who entered partial retirement (and who were not unemployed), about 23.4 percent [calculated as  $.135/(.135 + .441)$ ] had been fully

Table 1. Retirement status by age, selected years, 1969-75

Age	Nonretirement				Partial retirement				Full retirement			
	1969	1971	1973	1975	1969	1971	1973	1975	1969	1971	1973	1975
58	.85	—	—	—	.05	—	—	—	.09	—	—	—
59	.81	—	—	—	.06	—	—	—	.12	—	—	—
60	.79	.77	—	—	.06	.06	—	—	.12	.14	—	—
61	.72	.70	—	—	.08	.07	—	—	.18	.20	—	—
62	.64	.61	.56	—	.12	.09	.10	—	.23	.27	.33	—
63	.56	.49	.47	—	.16	.12	.09	—	.27	.36	.40	—
64	—	.44	.40	.35	—	.13	.12	.13	—	.41	.47	.50
65	—	.24	.17	.17	—	.19	.16	.15	—	.54	.66	.67
66	—	—	.13	.11	—	—	.17	.17	—	—	.69	.70
67	—	—	.13	.09	—	—	.15	.18	—	—	.71	.72
68	—	—	—	.08	—	—	—	.15	—	—	—	.77
69	—	—	—	.06	—	—	—	.17	—	—	—	.76

**Table 2. Two-year transition rates between labor force states**

Final status	Entry rates from—			
	Nonretirement	Partial retirement	Full retirement	Unemployment
Nonretirement . . . . .	.959	.024	.007	.010
Partial retirement . . . . .	.441	.400	.135	.024
Full retirement . . . . .	.303	.094	.588	.014
Unemployment . . . . .	.711	.093	.069	.127
	Exit rates from—			
	Nonretirement	Partial retirement	Full retirement	Unemployment
Nonretirement . . . . .	.609	.077	.008	.226
Partial retirement . . . . .	.105	.485	.057	.208
Full retirement . . . . .	.268	.426	.932	.448
Unemployment . . . . .	.018	.012	.003	.118

retired in the previous survey. Of the men who left partial retirement and did not become unemployed, 15.3 percent [calculated as  $.077 / (.077 + .426)$ ] were not retired in the next survey. The entry rate for the third “reverse” flow, that from full retirement to nonretirement, and the corresponding exit rate were both less than 1 percent.

*Continuation rates by age.* It is useful to examine in more depth the way these flows, and especially the continuation rates—the diagonal elements of the lower parts of table 2—vary with age. Table 3 reports, by respondent’s age in the initial year, the proportions of individuals who continue in the same retirement category until the next survey 2 years later.

How should these continuation rates behave? We know that pension programs and mandatory retirement provisions boost the likelihood of retirement at ages 62 and 65, either by providing incentives for individuals to leave their jobs or by forcing them to retire at a specified age. Moreover, while there is controversy about the effects of social security payments at 62, we know that beyond age 64 the benefit adjustments for this cohort were not actuarially fair, providing further incentive for retirement.<sup>14</sup> In terms of labor supply, the effects of changing health and family structure and the increasing disutility of work should act to reduce continuation rates in nonretirement below the high levels typical of individuals in their prime working years.

There is indeed evidence of rapidly falling continuation rates for nonretirement up to age 64. These range from 87 percent at age 58 to 27 percent at age 64—the age when the strongest economic incentives to leave nonretirement are about to be encountered. The continuation rates for 65- to 67-year-olds lie above those for 64-year-olds, but well below the rates observed for those in their late 50’s and early 60’s.

For the partially retired, continuation rates hold relatively steady in the 45- to 50-percent range up to age 64. The continuation rates for full retirement are very high at all ages, ranging from 91.8 to 94.4 percent. Among the unemployed, there are too few observations to permit gener-

alizations about the pattern of the continuation rates.

*Duration dependence of continuation rates.* A related issue, particularly for partial retirement, is whether the continuation rate depends on how long the individual has been partially retired—that is, the duration dependence of continuation rates.

To investigate this issue, we examined data for those individuals who were not retired in 1969 but who were partially retired in 1971. This avoids our having to deal with periods of partial retirement already in progress. Moreover, the requirement that individuals had been working full time in 1969 ensures that we are looking at persons who are following the normal retirement sequence and who perhaps are not quite as likely to be responding to unusual or unexpected circumstances. Of this group, 292 were still in the sample by 1973, and of that number 122, or 41.8 percent, were still partially retired in 1973. Hence, a person partially retired for the first time in 1971 had a 41.8-percent initial 2-year continuation rate.

Some 112 of the 122 individuals who were partially retired in both 1971 and 1973 were in the sample in 1975, and of those men 75, or 67.7 percent, were still partially retired. Hence, the 2-year continuation rate is considerably higher for individuals with durations in partial retirement of between 2 and 4 years than for individuals with durations of less than 2 years.<sup>15</sup> It should be kept in mind that these individuals were also growing older with each successive survey, and the evidence from table 3 indicates that this could be part of the explanation as to why the individuals exhibited higher continuation rates between 1973 and 1975 than between 1971 and 1973. Even so, the magnitude of the increase in the continuation rate from 41.8 percent to 67.7 percent is relatively large compared to changes in the continuation rates caused by an additional 2 years of age, as indicated in table 3. It would appear that there is some duration dependence, in that the continuation rate for partial retirement increases with the length of time the individual has been partially retired.

**Table 3. Two-year labor force status continuation rates, by age of respondent**

Age in initial period	Labor force status			
	Nonretirement	Partial retirement	Full retirement	Unemployment
58 . . . . .	.873	.409	.926	<sup>1</sup> .222
59 . . . . .	.831	.472	.939	<sup>1</sup> .267
60 . . . . .	.713	.467	.934	.242
61 . . . . .	.652	.450	.921	.070
62 . . . . .	.632	.458	.918	.105
63 . . . . .	.327	.446	.931	.114
64 . . . . .	.267	.475	.933	<sup>1</sup> .000
65 . . . . .	.415	.510	.934	<sup>1</sup> .053
66 . . . . .	.515	.597	.944	<sup>1</sup> .000
67 . . . . .	.432	.604	.932	<sup>1</sup> .000

<sup>1</sup>Sample size less than 25.



*Detailed flows for the partially retired.* Table 4 looks at the flows of partially retired men in somewhat greater detail to shed some light on the mechanism of partial retirement. These individuals are separated into three categories according to the relationship between their nonretirement and partial retirement jobs. The top line of both sections of the table considers individuals who have partially retired in jobs in which they reported themselves not retired in a previous survey or, if the observation is for the first survey, in jobs which they started before age 55. The second line refers to individuals who have partially retired to jobs which are different from any jobs in which they reported themselves not retired in prior surveys. The third line indicates individuals who are partially retired, but for whom the relationship of the nonretirement and partial retirement jobs could not be classified in one of the other two categories.<sup>16</sup>

The information in the table has a couple of interesting implications. First, it suggests that partial retirement in a job previously reported as a nonretirement job and partial retirement at a different job are relatively distinct paths. Of the individuals leaving partial retirement in a job previously reported as a nonretirement job, only 7.3 percent (calculated as .039/.531) were found to be partially retired in a different job, and of the individuals entering partial retirement in a job not previously reported as a nonretirement job, only 4.4 percent (calculated as .032/.727) were entering from partial retirement in a job previously reported as a nonretirement job or in a different job.

Second, a comparison of the exit rates of individuals partially retired in jobs previously reported as nonretirement

jobs and individuals partially retired in different jobs indicates that the behavior of these two groups is generally similar. A man partially retired in a job previously reported as a nonretirement job was a couple of percentage points (9.1 percent vs. 6.9 percent) more likely to return to nonretirement, while one partially retired in a different job was 3 percentage points (35.4 percent vs. 32.4 percent) more likely to retire completely. Both groups were about equally likely (57.9 percent vs. 56.8 percent) to continue partial retirement in some form. Individuals who were partially retired but who could not be assigned to either one of the above categories appear to be somewhat different, with substantially lower probabilities of continuing partial retirement and substantially higher probabilities of complete retirement. It is likely that these unclassified individuals in fact are partially retired in jobs they did not previously hold as nonretirement jobs, but it is not possible to be entirely sure of this.

### Implications for retirement models

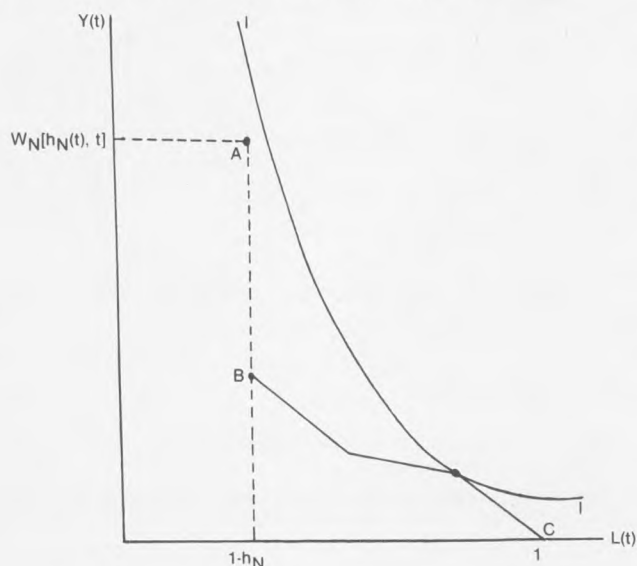
One aspect of the descriptive statistics from the Retirement History Survey has particular importance for retirement models of the type presented earlier in this article. Namely, the data indicate that, although a substantial minority of older men pass through a stage of partial retirement, the spells of such retirement typically are very short. More than half of these spells appear to last less than 2 years, and it seems likely that few individuals would be partially retired for a significant fraction of their working lives. This fact, when considered together with the observed incidence of partial retirement, provides a powerful clue to the nature of the utility function on which individuals are basing their retirement decisions.

Exhibit 1 illustrates this maximization problem facing the individual at time *t*. (See appendix.) The indifference curve **I—I** is one of a set of such curves, all of which are vertical displacements of one another, or equivalently, all having the same slope along any vertical line.<sup>17</sup> The budget constraint for the individual at time *t* consists of point *A* plus the line segments between *B* and *C*. Point *A* corresponds to the earnings and leisure available if the person chooses to work on the nonretirement job. The series of line segments between *B* and *C* represent potential income opportunities if he works at a partial retirement job, allowing for effects such as the reduction in social security benefits after a disregard amount.<sup>18</sup> The individual chooses the point along this constraint which enables him to reach the highest indifference curve. This may occur at point *A*, in which case the individual is nonretired, or at some point between *B* and *C*, which corresponds to partial retirement, or at *C*, which represents full retirement. (Notice that a value of zero at time *t*, which is associated with point *C*, does not mean that consumption, or income from social security, pensions, or other programs would be zero should the outcome associated with point *C* be chosen.)

**Table 4. Detailed 2-year transition rates for partially retired individuals**

Final status	Entry rates from—					
	Non-retirement	Partial retirement—			Full retirement	Unemployment
		In the non-retirement job	In a different job	In a non-classified job		
Partial retirement in:						
The nonretirement job . . . . .	.566	.434	.000	.000	.000	.000
A different job . . . . .	.422	.032	.273	.094	.144	.034
A nonclassified job . . . . .	.360	.051	.039	.285	.231	.034
	Exit rates from partial retirement in—					
	The nonretirement job	A different job		A nonclassified job		
Nonretirement . . . . .	.091	.069		.071		
Partial retirement in:						
The nonretirement job . . . . .	.469	.000		.000		
A different job . . . . .	.039	.487		.082		
A nonclassified job . . . . .	.071	.081		.293		
Full retirement . . . . .	.324	.354		.536		
Unemployment . . . . .	.006	.009		.018		

Exhibit 1. The earnings-leisure choice at time  $t$



Over time, this diagram changes in some important respects. First, the indifference curves will rotate clockwise—that is, other things equal, they will become steeper as an individual ages, reflecting the fact that work is likely to be less attractive with increasing age. Point A may shift downward as well, because past a certain age the availability of both social security and private pensions may reduce effective compensation for work. The budget line between B and C may also be affected, but here we would not expect the effects to be too great, particularly for the part of the constraint that lies below the social security disregard amount. In this range, social security will not change the effective compensation for employment, and partial retirement jobs are unlikely to involve pension plans that alter the effective compensation.

Now consider the implications of the two facts noted above: first, that a substantial minority of older workers go through a phase of partial retirement and, second, that for most of them the period in partial retirement is fairly short. According to exhibit 1, there are two ways in which an individual might find it optimal to retire partially for a short time. One possibility is that he has a set of indifference curves with just the right degree of curvature so that when he leaves point A, the tangency with the budget segment BC will already be very close to C. In this case, only a slight rotation of the curve or a slight decline in the partial retirement wage rate would be sufficient to induce him to retire fully after a brief period of partial retirement. This might be a satisfactory explanation for the behavior of some individuals, but it seems unlikely that most partial retirees have indifference curves so shaped that they retire for only a short period despite the fact that they face a wide range of wages in the nonretirement and partial retirement jobs.

This leaves a second explanation for short periods of partial retirement, specifically, that the indifference curves are rotating fairly rapidly. For example, when an individual leaves the nonretirement job and partially retires, his indifference curve may have a tangency at any point along BC. If the indifference curves are rotating rapidly, the point of tangency will travel along BC toward C rather quickly, and the individual will fully retire after a fairly brief spell of partial retirement.

The descriptive statistics cited earlier thus suggest that the indifference curves in exhibit 1 have enough curvature that at least some persons partially retire, and that the curves are rotating fairly rapidly, becoming significantly steeper as the individual ages. But what do these results imply about the utility function in the original structural model, namely  $u[C(t), L(t), t; \beta]$ ? To examine this issue, consider the specific function

$$(7) \quad u[C(t), L(t), t; \beta] = [\theta(t)/\rho] \cdot [C(t)^\rho + b(\beta, t)L(t)^\rho], \quad \rho < 1$$

where  $\theta(t)$  is the time preference discount factor and  $\sigma = 1/(1 - \rho)$  is within-period elasticity of substitution between consumption and leisure.<sup>19</sup> The indifference curves implied by this utility function have slope  $S_u = -b(\beta, t) [L(t)/C(t)]^{\rho-1}$ . The corresponding indifference curves in exhibit 1 have slope  $S_z = -b(\beta, t) \theta(t) L(t)^{\rho-1} / [\lambda_Y d(t)]$ .<sup>20</sup> For a given point in exhibit 1,  $S_z$  changes over time with the quantity  $b(\beta, t) \theta(t)/d(t)$ , while for a given point in the consumption-leisure space of  $u$ ,  $S_u$  changes according to  $b(\beta, t)$ . Unless the rate of time preference exceeds the discount rate by a considerable amount, both sets of indifference curves will be rotating rapidly if either is. Thus, the fact that few individuals who partially retire do so for long, which suggests that the indifference curves in exhibit 1 are rotating rapidly, implies that the indifference curves corresponding to the utility function in the structural model also are rotating rapidly as the individual ages.

### Models for policy evaluation and research

The descriptive statistics presented in this article impose some important requirements for a good structural retirement model. First, the model should be able to explain the behavior of labor force status continuation rates, especially the sharp dip in these rates as workers approach age 65. It seems likely that the explanation for this dip lies in the effect of pension and social security benefit formulae, mandatory retirement policies, and other factors affecting the individual's consumption-leisure budget line. Certainly, models that explain these continuation rates in terms of *ad hoc*, discrete, age-related changes in slopes of the indifference curves should be interpreted cautiously, particularly if they are intended to predict the effects of hypothetical changes in social security or pension rules.<sup>21</sup> Second, a good structural model must deal with the minority of observations for



which the flows appear to run counter to the normal retirement sequence. In particular, it is necessary to determine whether these reverse flows are the result of expected but unusual paths of the wages in the full-time or partial retirement jobs, or if, as seems more likely, they signify responses to unforeseen events or to miscalculations. In the latter case, the proper model may be a stochastic model in which the individual recalculates the optimal labor supply path in each period conditional on his past decisions, taking into account current or expected future changes which were not foreseen when he made his previous calculations.

The statistics also suggest an important characteristic of

the lifetime utility function that individuals are attempting to maximize. Specifically, the fact that a significant number partially retire but that few of them remain in the state for very long implies that, whether the tradeoff is in terms of earnings vs. leisure or consumption vs. leisure, the indifference curves of the individuals are relatively convex but rotating fairly rapidly with age. If confirmed by further studies, this would be an important finding, for the speed with which these indifference curves rotate is a major factor in estimating the effects of potential changes in such programs as social security and private pensions on the amount of labor individuals wish to supply to the market. □

—FOOTNOTES—

<sup>1</sup> Alan L. Gustman and Thomas L. Steinmeier, "Partial Retirement and the Analysis of Retirement Behavior," *Industrial and Labor Relations Review*, April 1984.

<sup>2</sup> For that analysis, the main job was defined as the job held by the individual at age 55.

<sup>3</sup> The Retirement History Survey is a 10-year longitudinal survey of a national sample of 11,153 persons age 58 to 63 in 1969. The survey reports on the individual's work history, health, financial status, and other information relevant for studying retirement. For a description of this survey, see U.S. Department of Health, Education and Welfare, Social Security Administration, Office of Research and Statistics, *Almost 65: Baseline Data From the Retirement History Study* (Washington, U.S. Government Printing Office, 1976).

<sup>4</sup> Alan L. Gustman and Thomas L. Steinmeier, *Partial Retirement and Wage Profiles for Older Workers*, NBER Working Paper No. 1000 (Cambridge, Mass., National Bureau of Economic Research, October 1982).

<sup>5</sup> Alan L. Gustman and Thomas L. Steinmeier, "Minimum Hours Constraints and Retirement Behavior," *Contemporary Policy Issues*, April 1983, pp. 77-91.

<sup>6</sup> Counting each observation for a given employer only one time, we found that for a sample of older white men who were not self-employed, 53 percent of the partially retired were in jobs at which they had previously worked full time, and the remainder were in jobs at which they had not previously reported working full time. See Gustman and Steinmeier, *Partial Retirement and Wage Profiles*. The proportion who partially retire on jobs they held at age 55 is considerably smaller than the proportion who partially retire on jobs they held while not retired. See Gustman and Steinmeier, "Partial Retirement and Retirement Behavior."

<sup>7</sup> Including a bequest motive in the budget constraint would leave the discussion unchanged.

<sup>8</sup> In this formal model, the "partial retirement" job may refer to a job distinct from the nonretirement job, or it may refer to the opportunity to remain in the nonretirement job and work less than full time at a reduced wage. Separation from a job may also be involuntary. Note, however, that it would be difficult to interpret the meaning of the reason for separation. For example, an employer with an unemployment insurance tax rate that was outside the range of experience rating might have agreed to lay off some workers before they retired to allow them to collect unemployment insurance benefits. The period covered by our data predates changes in unemployment insurance regulations which were designed to deal with such problems.

<sup>9</sup> A closely related model could be developed with the assumption that labor supplied to the partial retirement job must fall within a more restricted range.

<sup>10</sup> See, for example, Henry Aaron, *Economic Effects of Social Security* (Washington, The Brookings Institution, 1982).

<sup>11</sup> A fourth category, not included in table 1, consists of anyone who reported that his major activity during the survey week was looking for work. With the exception of one cell (61 year-olds in 1971), the percentage in this category never exceeded 2 percent. People were classified as not retired, partially retired, or fully retired on the basis of their answers to

the question "Do you consider yourself to be completely retired, partially retired, or not retired at all?"

<sup>12</sup> The figures in table 2 exclude data for individuals who dropped out of the sample in the subsequent survey (for exit rates) or who were not in the sample in the previous survey (for entry rates). The principal reasons for being out of the sample were death and nonresponse. The percentages of individuals who dropped out of the sample by the next survey were 10.1 for nonretired workers, 11.4 for partially retired workers, 15.0 for fully retired workers, and 10.2 for unemployed workers. Only 2.2 percent of the individuals who dropped out of the sample subsequently reentered, and most of those who did so reported themselves as fully retired.

<sup>13</sup> With a constant hazard rate, durations are distributed with the exponential density function  $f(t) = \gamma \exp(-\gamma t)$ . If 51.5 percent of this distribution lies between zero and 2,  $\gamma$  may be calculated as .362. The mean of the distribution is then calculated as 2.76 years.

<sup>14</sup> There is little reliable information on the incentive effects for partial retirement. For some discussion, see Gustman and Steinmeier, "Minimum Hours Constraints," and "Partial Retirement and the Analysis of Retirement Behavior." Reduced-form retirement equations which include partial retirement as an outcome are reported in the first paper.

<sup>15</sup> Given the sizes of the two samples, the difference between 41.8 percent and 67.7 percent is statistically significant at better than a 1-percent confidence level.

<sup>16</sup> Note especially that this group includes anyone who was partially retired during the initial survey but whose current job began after age 55.

<sup>17</sup> This may be shown by examining the slope of an indifference curve at any point in the diagram. This slope is given by  $S_L = Z_L/Z_Y$ . From appendix equation (12),  $Z_L$  does not depend on  $Y(t)$ , so that it may be written  $Z_L [L(t), t; \beta, \lambda_Y d(t)]$ , and  $Z_Y = \lambda_Y d(t)$ . Thus:

$$S_L = \frac{Z_L [L(t), t; \beta, \lambda_Y d(t)]}{[\lambda_Y d(t)]}$$

Because  $Y(t)$  does not appear either directly or indirectly in this expression, the slope of the indifference curve at time  $t$  depends only on  $L(t)$  and all the curves thus must have the same slope.

<sup>18</sup> For a related discussion, see Alan S. Blinder, *Private Pensions and Public Pensions: Theory and Fact*, NBER Working Paper No. 902 (Cambridge, Mass., National Bureau of Economic Research, June 1982).

<sup>19</sup> This is similar to the utility function presented in Roger H. Gordon and Alan S. Blinder, "Market Wages, Reservation Wages and Retirement," *Journal of Public Economics*, Vol. 14, 1980, pp. 277-308. Note that it would not make sense to choose  $u$  to be linear homogeneous, for the resulting indifference curves in the exhibit would necessarily be straight lines. This may be shown as follows. In a linear homogeneous function, both  $u_C$  and  $u_L$  are strict functions of the ratio  $C(t)/L(t)$ , and hence of each other. By appendix equation (10),  $u_C$  is equal to  $\lambda_Y d(t)$ , which is independent of earnings and leisure at time  $t$ , giving the result. The Gordon-Blinder function does satisfy the criterion that the degree of homogeneity should be less than 1, yielding convex indifference curves as in exhibit 1.

<sup>20</sup> If  $\rho$  is close to 1, the indifference curves associated with both  $u$  and  $Z$  have little curvature. Hence the existence of a substantial amount of

partial retirement at reduced compensation rates would suggest that  $\rho$  cannot be close to 1 for all individuals. This reasoning is contrary to Gordon and Blinder's empirical finding that  $\rho = 0.9$ , relatively close to 1.

<sup>21</sup> It might be argued that a more elaborate model than ours is appropriate because discontinuities at particular ages may result from the influence of

some socially acceptable retirement age, which in turn is influenced by program parameters. But to analyze the effects of changes in retirement policy, the role of a socially acceptable retirement age should be modeled explicitly, because the effects of these age terms may be altered by the policy change.

## APPENDIX: Converting from consumption to earnings

To derive the tradeoffs between earnings and leisure shown in text exhibit 1, it is necessary to derive the relationship between consumption and earnings along the solution path of the model. At any point in time, the solution path maximizes the quantity

$$(8) \quad Z(t) = u[C(t), L(t), t; \beta] + \lambda_Y d(t) S(t)$$

where  $S(t) = Y(t) - C(t)$  is the amount saved in period  $t$  and  $Y(t) = W_N[H_N(t), t] + W_P[H_P(t), t]$  is the net compensation for labor supplied in period  $t$ .  $\lambda_Y$  may be interpreted as the marginal utility of discounted lifetime income—that is, the marginal utility of relaxing the lifetime budget constraint by \$1.<sup>1</sup> It is chosen so that when this optimization is implemented for all periods, the lifetime budget constraint  $\int_0^T d(t) S(t) dt + A_0 = 0$  is just satisfied. The maximization is subject to the constraints of equations (3) through (6), which describe the hours limitations on the two types of employment.

If we substitute for  $S(t)$  in equation (8), the maximand in this problem becomes

$$(9) \quad Z(t) = u[C(t), L(t), t; \beta] + \lambda_Y d(t) [Y(t) - C(t)]$$

Because  $C(t)$  appears neither in the definition of  $Y(t)$  nor in

any of the constraints in text equations (3) through (6), the value of  $C(t)$  which maximizes equation (9) may be found simply by differentiating the equation and setting the result equal to zero:

$$(10) \quad \frac{dZ(t)}{dC(t)} = u_C[C(t), L(t), t; \beta] - \lambda_Y d(t) = 0$$

where  $u_C$  indicates the partial derivative with respect to the first argument. This equation may then be solved for the optimal  $C^*(t)$  as a function of  $L(t)$  and  $\lambda_Y d(t)$ :

$$(11) \quad C^*(t) = C^* [L(t), t; \beta, \lambda_Y d(t)]$$

This may in turn be substituted into equation (9) to yield:

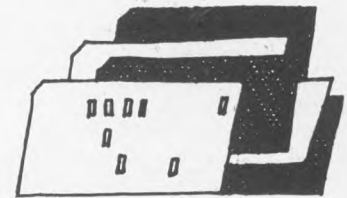
$$(12) \quad \begin{aligned} Z(t) &= u\{C^* [L(t), t; \beta, \lambda_Y d(t)], L(t), t; \beta\} \\ &+ \lambda_Y d(t) \{Y(t) - C^* [L(t), t; \beta, \lambda_Y d(t)]\} \\ &= Z[Y(t), L(t), t; \beta, \lambda_Y d(t)] \end{aligned}$$

At a particular time, this means that the individual may be viewed as maximizing a utility function involving only income and leisure,<sup>2</sup> instead of consumption and leisure as in equation (8). The maximization is done subject to the definition of  $Y(t)$  and the constraints of equations (3) through (6).

### FOOTNOTES

<sup>1</sup> See Thomas L. MaCurdy, "An Empirical Model of Labor Supply In a Life-Cycle Setting," *Journal of Political Economy*, December 1981, pp. 1059-85.

<sup>2</sup> The fact that  $\lambda_Y$  appears in  $z[\cdot]$  means that the function cannot be viewed as constant from individual to individual, because  $\lambda_Y$  depends on earnings opportunities in other years.



## Fewer students in work force as school age population declines

ANNE MCDUGALL YOUNG

The continuing decline in the 16- to 24-year-old population accounted for most of the half million drop in the school-age work force between October 1982 and October 1983. Sixty percent of this decrease was among students. In addition, labor force participation rates edged down among most student groups but were unchanged among out-of-school youth. Lower unemployment rates were recorded among both students and nonstudents, reflecting the strengthened economy. Not all worker groups shared in this improvement, however.<sup>1</sup> (See table 1.)

### Students

Over a third of the high school students and over half of all college students were in the labor force, that is, working or looking for work, in October 1983. The labor force participation rate was virtually the same for female and male students at each level of school attended. This is in sharp contrast to the 1960's and early 1970's, when participation rates were as much as 11 percentage points higher among male high schoolers and 9 percentage points among male full-time college students.

**Employment.** About 29 percent of high school students and 40 percent of full-time college students had jobs in October 1983. Students usually work in industries requiring either irregular hours or extended schedules beyond "9 to 5," such as retail stores, restaurants (including "fast food" establishments), and financial service organizations. In October 1983, 84 percent of all employed teenage students and 71 percent of employed 20- to 24-year-old students were in the trade or services industries.

Full-time college students were employed an average of 18 hours per week compared to nearly 14 hours for high

school students. (See table 2.) Relatively few students worked full time (35 hours or more per week). Among both high school and full-time college students, the trend since 1970 has been for the working hours of women to rise while those of men have held steady, reflecting the increasing proportion of women who worked 15 to 21 hours and the decreasing proportion of men working more than 21 hours. Average hours worked by full-time college women have increased by more than 3 hours since 1967.

Among college students, paid employment is often arranged as part of a financial aid package along with scholarship grants and loans. The longitudinal study, "High School and Beyond,"<sup>2</sup> reported that 56 percent of the 1980 high school graduates who were enrolled in some form of post-secondary education used earnings to help finance their schooling.<sup>3</sup> About one-third of all employed full-time college students worked up to 14 hours per week, and another third worked 15 to 21 hours in October 1983.

**Table 2. Hours worked in nonagricultural industries by persons 16 to 24 years, enrolled in school by level of school attended, and sex, selected years, October 1967-83**

[Numbers in thousands]

Hours of work and sex	High school				
	October 1967	October 1970	October 1973	October 1980	October 1983
Total at work	2,953	3,163	3,740	3,311	2,836
Percent	100.0	100.0	100.0	100.0	100.0
1 to 14 hours	61.7	57.3	51.6	51.0	57.2
15 to 21 hours	19.8	24.0	27.3	30.5	28.6
22 to 34 hours	11.7	12.6	14.5	13.4	9.9
35 hours and over	6.7	6.1	6.6	5.1	4.3
Average hours (mean):					
Total	13.9	14.3	15.2	14.9	13.6
Men	15.5	16.0	17.0	15.8	14.3
Women	11.8	12.2	13.1	14.1	13.0
Hours of work and sex	Full-time college				
	October 1967	October 1970	October 1973	October 1980	October 1983
Total at work	1,308	1,709	1,913	2,395	2,509
Percent	100.0	100.0	100.0	100.0	100.0
1 to 14 hours	42.7	36.2	33.4	36.5	33.8
15 to 21 hours	30.3	35.9	35.9	36.9	38.5
22 to 34 hours	16.8	16.7	18.6	17.0	18.2
35 hours and over	10.2	11.2	12.2	9.6	9.5
Average hours (mean):					
Total	17.2	18.2	18.9	17.8	18.2
Men	19.6	20.6	21.4	19.7	19.6
Women	14.3	15.6	16.9	17.4	17.6

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## Out-of-school youth

The labor force activity of 16- to 24-year-old men and women who were no longer in school varied much more than among students. Women were less likely than men to be in the labor force at every level of completed education, with the difference narrowing as years of schooling increased. (See table 1.) Among high school dropouts, the labor force participation rate of women was 35 percentage points lower than that of men. Family responsibilities accounted for a large part of the difference; about half of the female dropouts were or had been married as of October 1983. However, male dropouts were more likely than women to have left school for job-related reasons or to support their family.<sup>4</sup> At the other end of the educational spectrum, the

difference in participation rates between male and female college graduates differed by only about 4 percentage points.

Except for high school dropouts, unemployment rates were generally about the same for men and women who were no longer in school and had completed the same years of schooling. Among persons with 4 years of high school or more, male and female unemployment rates have differed by only 1 or 2 percentage points since the mid-1970's. Among the dropouts, women's unemployment rates have historically been 5 to 8 percentage points higher than those of men. By October 1982, the difference had narrowed, in part, because of the recession-related increase in unemployment among men. In October 1983, the difference remained small, but the unemployment rate for women was once again significantly higher as the unemployment rate

**Table 1. Employment status of persons 16 to 24 years by school enrollment status, years of school completed, and sex, October, 1982-83**

[Numbers in thousands]

Characteristic	Civilian noninstitutional population		Civilian labor force		Participation rate		Unemployed		Unemployment rate	
	1982	1983	1982	1983	1982	1983	1982	1983	1982	1983
Total, 16 to 24 years	36,452	35,884	24,076	23,557	66.0	65.6	4,331	3,704	18.0	15.7
<b>Enrolled</b>										
Total, 16 to 24 years	15,624	15,357	7,194	6,883	46.0	44.8	1,202	1,053	16.7	15.5
16 to 19 years	10,725	10,637	4,398	4,233	41.0	39.8	916	798	20.8	18.9
20 to 24 years	4,897	4,720	2,796	2,650	57.1	56.1	286	255	10.2	9.6
High school	7,701	7,628	2,970	2,802	38.6	36.7	707	621	23.8	22.2
College	7,923	7,728	4,222	4,080	53.3	52.8	496	433	11.7	10.6
Full-time students	6,546	6,453	2,992	2,955	45.7	45.8	381	350	12.7	11.8
Part-time students	1,377	1,275	1,230	1,125	89.3	88.2	115	83	9.3	7.4
Men, 16 to 24 years	7,991	7,942	3,628	3,563	45.4	44.9	674	568	18.6	15.9
16 to 19 years	5,457	5,360	2,211	2,127	40.5	39.7	493	422	22.3	19.8
20 to 24 years	2,534	2,582	1,417	1,436	55.9	55.6	180	146	12.7	10.2
High school	4,045	4,016	1,589	1,490	39.3	37.1	417	344	26.2	23.1
College	3,945	3,925	2,038	2,070	51.7	52.7	258	223	12.7	10.9
Full-time students	3,336	3,294	1,481	1,500	44.9	45.5	186	182	12.6	12.3
Part-time students	609	631	557	570	91.5	90.3	72	41	12.9	7.2
Women, 16 to 24 years	7,633	7,415	3,566	3,320	46.7	44.8	528	485	14.8	14.6
16 to 19 years	5,270	5,277	2,187	2,106	41.5	39.9	423	376	19.3	17.9
20 to 24 years	2,363	2,138	1,379	1,214	58.4	56.8	105	109	7.6	9.0
High school	3,656	3,612	1,381	1,312	37.8	36.3	290	277	21.0	21.1
College	3,978	3,803	2,184	2,010	54.9	52.9	238	210	10.9	10.4
Full-time students	3,210	3,159	1,511	1,455	47.1	46.1	195	168	12.9	11.5
Part-time students	768	644	673	555	87.6	86.2	43	42	6.4	7.6
<b>Not enrolled</b>										
Total, 16 to 24 years	20,828	20,527	16,882	16,674	81.1	81.2	3,129	2,651	18.5	15.9
16 to 19 years	4,901	4,486	3,709	3,387	75.7	75.5	1,009	829	27.2	24.5
20 to 24 years	15,926	16,041	13,173	13,286	82.7	82.8	2,120	1,822	16.1	13.7
Men, 16 to 24 years	9,947	9,770	9,056	8,878	91.0	90.9	1,742	1,462	19.2	16.5
16 to 19 years	2,359	2,226	1,971	1,855	83.6	83.3	542	448	27.5	24.2
20 to 24 years	7,588	7,544	7,086	7,023	93.4	93.1	1,200	1,014	16.9	14.4
Less than 4 years of high school	2,600	2,631	2,193	2,182	84.3	82.9	684	572	31.2	26.2
16 to 19 years	981	882	765	662	78.0	75.1	297	216	38.8	32.6
20 to 24 years	1,620	1,749	1,428	1,520	88.1	86.9	387	356	27.1	23.4
4 years of high school	5,313	5,232	4,915	4,856	92.5	92.8	851	730	17.3	15.0
1 to 3 years of college	1,333	1,259	1,262	1,201	94.7	95.4	148	121	11.7	10.1
4 years of college or more	701	648	687	638	98.0	98.5	58	38	8.4	6.0
Women, 16 to 24 years	10,881	10,757	7,826	7,795	71.9	72.5	1,387	1,189	17.7	15.3
16 to 19 years	2,543	2,260	1,739	1,532	68.4	67.8	466	381	26.8	24.9
20 to 24 years	8,338	8,497	6,087	6,263	73.0	73.7	921	808	15.1	12.9
Less than 4 years of high school	2,455	2,275	1,159	1,082	47.2	47.6	382	319	33.0	29.5
16 to 19 years	910	745	442	335	48.6	45.0	172	110	38.9	32.8
20 to 24 years	1,545	1,530	719	747	46.5	48.8	212	209	29.5	28.0
4 years of high school	5,903	5,803	4,464	4,342	75.6	74.8	769	671	17.2	15.5
1 to 3 years of college	1,691	1,726	1,428	1,468	84.4	85.1	160	131	11.2	8.9
4 years of college or more	833	955	775	904	93.0	94.7	76	70	9.8	7.7

NOTE: Because of rounding, sums of individual items may not equal totals.

for men declined more during recovery.

### White, black, and Hispanic youth

Labor force participation was about unchanged over the year among white and black youth for both students and nonstudents. (See table 3.) Black youth, however, continued to be less than half as likely as whites to be in the labor force while in high school, and substantial differences also persisted by race among college students and out-of-school youth at all educational attainment levels. Participation rates for black high school students and high school graduates have been declining for several years. Among black high school students, for example, the participation rate slipped from 25 percent in October 1978 and 1979 to 16 percent in October 1983 and declined from 78 to 72 percent over the same period for black high school graduates. On the other hand, the participation rates for black college students and those out of school with some college education have been fairly stable.

Labor force participation rates of Hispanic students were also about unchanged over the year and remained between those of black and white youth. Relatively more Hispanic than white students in the labor force were enrolled at the high school level, perhaps reflecting slower progress in school for those who lacked a facility with English and/or were poorly prepared. Some 38 percent of the Hispanic high school students were age 18 or older, compared to 17 percent of the white high schoolers. Among youth no longer in school, Hispanics were twice as likely as whites to have left school before graduating from high school, reflecting,

**Table 3. Labor force participation and unemployment rates of persons 16 to 24 years old by school enrollment, race, and Hispanic origin, October 1982-83**

Enrollment status	White		Black		Hispanic origin	
	1982	1983	1982	1983	1982	1983
<b>Enrolled</b>						
Labor force participation rate	49.2	48.4	28.7	25.6	34.6	35.6
High school students	43.0	41.6	18.6	16.1	23.5	25.9
College students	54.8	54.6	44.4	41.1	53.8	52.2
Unemployment rate	14.7	13.5	36.7	35.6	22.4	16.8
High school students	21.2	19.4	52.7	56.4	36.6	18.8
College students	10.2	9.4	26.6	22.3	12.7	15.7
<b>Not enrolled</b>						
Labor force participation rate	82.7	83.4	72.2	69.4	71.3	72.9
Less than 4 years of high school	68.2	68.9	59.3	57.3	65.0	66.3
4 years of high school only	85.2	85.5	74.7	71.7	76.0	77.2
College: 1 to 3 years	89.3	90.4	88.2	82.6	79.6	81.8
4 years or more	95.4	96.5	( <sup>1</sup> )	90.7	( <sup>1</sup> )	( <sup>1</sup> )
Unemployment rate	15.7	12.8	38.6	37.3	21.4	17.7
Less than 4 years of high school	27.8	23.5	52.9	48.0	24.7	22.0
4 years of high school only	14.6	11.9	35.7	37.5	19.9	17.5
College: 1 to 3 years	8.9	7.3	28.4	23.8	15.2	3.4
4 years or more	8.6	5.9	( <sup>1</sup> )	23.1	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup>Data not shown where base is less than 75,000.

**Table 4. School enrollment and labor force status of 1983 high school graduates and 1982-83 school dropouts 16 to 24 years, by sex, race, and Hispanic origin, October 1982-83**

(Numbers in thousands)

Characteristic	October 1982			October 1983		
	Civilian noninstitutional population	Participation rate	Unemployment rate	Civilian noninstitutional population	Participation rate	Unemployment rate
Total recent high school graduates <sup>1</sup>	3,100	63.0	22.5	2,964	63.6	22.3
Men	1,508	64.7	21.2	1,390	67.5	22.6
Women	1,592	61.3	23.9	1,574	60.2	22.0
White	2,644	64.5	19.0	2,496	64.6	7.7
Black	384	54.9	53.0	392	57.4	49.6
Hispanic origin	174	57.0	34.3	138	63.8	21.6
Enrolled in college	1,568	44.3	15.7	1,562	44.9	17.0
Men	739	42.8	14.6	721	47.7	17.4
Women	829	45.7	16.6	841	42.6	16.5
Full-time students	1,419	40.6	16.3	1,416	41.5	16.0
Part-time students	149	79.2	12.7	146	78.8	21.7
White	1,376	46.1	15.0	1,372	46.7	15.6
Black	140	30.0	( <sup>2</sup> )	151	27.8	( <sup>2</sup> )
Hispanic origin	75	33.3	( <sup>2</sup> )	75	34.7	( <sup>2</sup> )
Not enrolled in college	1,532	82.0	26.3	1,402	84.5	25.5
Men	769	85.8	24.4	669	88.8	25.6
Women	763	78.2	28.5	733	80.5	25.4
White	1,268	84.6	21.4	1,124	86.4	19.2
Black	244	69.3	58.0	241	75.9	54.1
Hispanic origin	99	74.7	( <sup>2</sup> )	63	( <sup>2</sup> )	( <sup>2</sup> )
Total recent school dropouts <sup>1</sup>	668	63.0	41.6	597	63.1	31.6
Men	355	76.6	43.4	329	75.4	32.7
Women	313	47.6	38.3	268	48.1	29.5
Single	216	50.5	38.5	208	50.0	33.7
Other marital status	96	41.7	( <sup>2</sup> )	60	( <sup>2</sup> )	( <sup>2</sup> )
White	513	67.1	36.0	445	63.8	25.7
Black	135	51.9	( <sup>2</sup> )	124	57.3	( <sup>2</sup> )
Hispanic origin	73	( <sup>2</sup> )	( <sup>2</sup> )	79	67.1	( <sup>2</sup> )

<sup>1</sup>Data refer to persons who graduated from high school or dropped out of school between October 1981-82 or October 1982-83.

<sup>2</sup>Percent not shown where base is less than 75,000.

NOTE: Detail for the above race and Hispanic-origin groups will not sum to totals because data for the "other races" group are not presented and Hispanics are included in both the white and black population groups.

in part, the need to help support their families as well as lack of opportunity for some of the immigrants among them to have attended school in their native country.

Unemployment rates dropped somewhat over the year among most groups of white students, and much larger declines took place among those no longer in school. For the latter group, the unemployment rates of 5.9 percent for college graduates, 11.9 for high school graduates, and 23.5 for high school dropouts were 2 to 4 percentage points lower than in 1982. By contrast, unemployment rates among black youth, both in and out of school, were nearly three times

as high as for whites and showed relatively little response to improved economic conditions. For Hispanic youth, jobless rates declined substantially among high school students and those no longer in school. However, the unemployment rate for out-of-school Hispanic youth remained almost 5 percentage points higher than for white youth.

### Recent high school graduates and dropouts

Although there were fewer high school graduates in 1983 than in 1982, about the same number went on to college in both years. (See table 4.) Thus, college enrollment levels remained unchanged, as a somewhat higher entry rate offset the declining school-age population. Black high school graduates continued to be less likely to enter college than white or Hispanic graduates.

Nearly 85 percent of recent high school graduates not enrolled in college were in the labor force in October 1983. This was somewhat higher than in October 1982, but, in contrast to the situation among the total out-of-school youth group, the unemployment rate for recent graduates was virtually unchanged. As among all 16- to 24-year-olds with a high school diploma, lower proportions of black and Hispanic recent graduates were in the labor force compared with whites.

The number of recent high school dropouts declined over the year, reflecting the decrease in the teenage population. In both 1982 and 1983, recent school leavers accounted for about 3 percent of all 16- to 24-year-olds no longer in school, down from 4 percent during the peak years of the baby boom. While about the same proportion of dropouts as a year earlier were in the labor force, unemployment rates for this group decreased by about 10 percentage points for both men and women. □

#### FOOTNOTES

<sup>1</sup>Data in this report are based primarily on supplementary questions in the October 1983 Current Population Survey (CPS), conducted and tabulated for the Bureau of Labor Statistics by the Bureau of the Census. Most data relate to persons 16 to 24 years of age in the civilian noninstitutional population in the week ending Oct. 15, 1983.

Sampling variability may be relatively large in cases where the numbers are small. Small estimates, or small differences between estimates, should be interpreted with caution. For the most recent report in this series, see Anne McDougall Young, "Youth labor force marked turning point in 1982," *Monthly Labor Review*, August 1983, pp. 29-32, reprinted with additional tabular data and explanatory notes as Bulletin 2192 (Bureau of Labor Statistics, December 1983).

<sup>2</sup>High School and Beyond (HS&B) is a national longitudinal study of high school students being conducted by the National Center for Education Statistics (NCES).

<sup>3</sup>*Packaging of Grants, Loans, and Earnings for Financing Postsecondary Education*, Bulletin 83-2206 (National Center for Education Statistics, February 1984).

<sup>4</sup>Samuel S. Peng, *High School Dropouts: Descriptive Information from High School and Beyond*, Bulletin 83-221b (National Center for Education Statistics, November 1983).

## Auto industry experiments with the Guaranteed Income Stream

PETER CAPPELLI

The Nation's recent experience with high unemployment and occupational dislocation has renewed the interest of workers and their unions in improving employment security through the collective bargaining process. William M. Davis notes, for example, that employment security was the most important topic in the 1983 round of national negotiations,<sup>1</sup> and results of a 1982 survey by D. Quinn Mills also suggest that concern with unemployment has been a major influence shaping current union bargaining positions.<sup>2</sup>

A number of innovative arrangements to improve employment security have come out of recent contract negotiations. Of these, perhaps the most interesting and important are the Guaranteed Income Stream (GIS) plans introduced in the auto industry. These plans address the growing problem of structural unemployment by providing a novel form of income protection for workers, and financial incentives for firms to avoid long-term layoffs and to find alternative employment for workers who are laid off.

### GIS versus other plans

There are two basic ways to ensure employment security. The first, and most straightforward, is to guarantee jobs directly, as in the case of contractual manning levels. In practice, these guarantees are difficult for workers to secure because they pose considerable risk to firms facing uncertain product markets. According to a June 1982 *Business Week* poll, only 2 percent of the firms surveyed were willing to provide explicit employment guarantees even in return for union concessions on other issues.<sup>3</sup> The most noteworthy of such agreements, the lifetime employment experiment introduced in the auto industry in 1982, covers relatively few workers in a small number of plants, giving rise to the possibility that these jobs will be guaranteed at the expense of employment and production opportunities at noncovered automaking facilities.

The second and more common method for addressing the problem of unemployment is through income maintenance plans. These protect workers' income from employment adjustments and provide financial incentives for firms to minimize layoffs. The most important of these are supplemental unemployment benefit plans (SUBS), which are a contractual form of unemployment insurance with perfect experience rating—each employer bears the total cost of unemployment benefits for its workers.<sup>4</sup> (State-sponsored plans, in contrast, involve cross-subsidization because an

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employer's contributions may not completely reflect the benefits its workers receive.)

SUBS and other income maintenance plans create incentives for stabilizing employment because they reduce the marginal cost of employment for covered workers. Because the employer must pay the SUB benefit when its workers are idle, the marginal cost of keeping a worker occupied productively is merely the difference between the SUB payment and the wage rate. One might expect this reduction in the marginal cost of labor to affect firms' operating decisions. With marginal cost pricing, they would be more likely to cut prices during economic downturns, maintaining production and employment levels.<sup>5</sup> Unfortunately, there is ample evidence that these income maintenance plans do not provide sufficient incentives for companies to stabilize employment in the face of steep recessions and structural changes in product markets. Further, the temporary income protection provided by SUBS, which were designed to cushion against short-term cyclical adjustments, is not adequate for the longer-term, structural unemployment characteristic of the 1980's.

The GIS plan represents an alternative which shares the basic income maintenance approach but differs from SUB plans in several important ways. First, while SUBS and other income maintenance plans end after relatively short periods (for example, 2 years) and provide temporary support for the long-term unemployed, GIS plans furnish benefits to eligible workers until they retire, if necessary. If SUBS provide a "guaranteed annual wage,"<sup>6</sup> then GIS plans provide a guaranteed lifetime wage. Second, qualification for GIS eligibility is based on earnings rather than simply on employment status. That is, a laid-off worker could find employment elsewhere and still be eligible for GIS benefits as long as his or her earnings from the alternative job were below a specified level. Finally, the benefits provided by the GIS plan are not completely offset by outside earnings until those earnings reach a specified "breakeven point." This is unlike the case for SUBS, where benefits are completely offset. Thus, workers can increase their net income under the GIS program by accepting other paid employment.

In fact, the GIS plan is a type of negative income tax similar in form to the Family Assistance Plan proposed during the Nixon Administration. Eligible workers receive a minimum benefit, and outside earnings from alternative employment are "taxed" or offset by reductions in that benefit. Because the rate of offset is less than complete (80 percent), workers net 20 cents from every dollar of outside earnings. Therefore, they have some incentive to seek alternative employment. Benefits continue to be paid until workers reach a combined income level (benefits plus earnings) call the "breakeven point" (1/tax rate), which in this case equals 125 percent of the minimum benefit. Beyond

this point, additional earnings are completely offset by benefit reductions, and the plan ceases to function.

Those employees with more than 15 years of seniority (10 years in cases of plant shutdowns) are eligible for the GIS program after their SUB benefits have been exhausted. The minimum benefit is equal to 50 percent of pretax earnings and rises 1 percentage point with each additional year of seniority. The table below shows the net earnings of GIS participants with pretax earnings of \$400 per week at different levels of seniority and outside earnings:

Seniority and minimum benefit	Outside earnings				
	\$0	\$200	\$250	\$325	\$375
15 years (50 percent) ..	\$200	\$240	\$250*	\$325	\$375
30 years (65 percent) ..	260	300	310	325*	375
40 years (75 percent) ..	300	340	350	365	375*

\*Indicates breakeven points.

The GIS approach differs from other income maintenance programs both in the type of unemployment it addresses and in the incentives it creates for workers and employers. Unlike SUB plans, which tie laid-off workers to their former employers, GIS plans create incentives to find alternative employment. The complete SUB benefit offset by earnings from an alternative job leaves workers with little financial incentive to look for work elsewhere, and the fact that benefits end after a reasonably short period means that firms have less of an incentive to find new jobs for these workers. SUB plans are beneficial to employers because they increase the likelihood that laid-off workers would be available for recall at the end of temporary cyclical downturns.

GIS, in contrast, provides workers with financial incentives to find alternative employment because the benefit offset is less than complete. Moreover, the long period of eligibility associated with GIS encourages firms to avoid layoffs by increasing the costs of permanent layoffs and reducing the marginal cost of keeping workers productively employed. Once workers are laid off, however, that long period of eligibility creates strong incentives for the firm to help workers find alternative employment at rates of pay above the GIS breakeven level.

### Labor force effects of GIS

One can get some idea of the likely effects of GIS plans by looking at the results of the negative income tax demonstration projects that were conducted during the 1970's. From the standpoint of public policy, the most important concern about negative income tax plans was their effect on

labor supply. Economic theory suggests that the introduction of minimum benefits will cause an income effect that would curtail labor supply. The benefit offset would reduce the return from working, producing a substitution effect that also reduces labor supply. Results from various demonstration projects showed the effects of negative income tax programs on labor supply to be rather small. Recipients tended to search longer for jobs and found marginally better-paying ones. It also appeared that the employment effects of the negative income tax extended to the families of recipients as well, the most important change being a reduction in labor force participation by wives of recipients.<sup>7</sup>

Another important effect of negative income tax-type plans like GIS may be their influence on the types of jobs that workers choose. To the extent that higher pay compensates for unpleasant work, one might expect GIS to reduce the incentives to accept such work because the worker receives less than the compensating wage differential after the benefit offset.

The magnitude of these effects depends largely on the rate of "tax," or benefit offset, prescribed by the plans. The tax rate determines the breakeven point, as well as the marginal incentives to alter one's behavior. If the rate is too low, the program covers more workers with higher earnings and becomes a burdensome expense to the company; if it is too high, workers have little incentive to pursue alternative employment. It might seem that the GIS 80-percent tax rate is quite high. A worker accepting employment at \$10 per hour, for example, would net only \$2 per hour and would pay government taxes on those earnings. Such a worker in the 30-percent tax bracket would take home only an additional \$1.40 per hour after government taxes and the benefit offset.

Because the GIS plan is new and eligibility was not extended to workers who had previously exhausted their SUB benefits, relatively few workers currently are drawing benefits from the plan. One of the requirements for continued eligibility is that workers must accept suitable employment when it is offered, and many workers lost their eligibility rather than accept transfers to auto plants in other parts of the country. Employers point out that within the same location, there has been little difficulty getting workers to accept new jobs with the company, but that it has been extremely difficult to get them to take jobs with other employers where the pay is less and the benefit offset applies. This suggests that the high rate of benefit offset may be a factor inhibiting reemployment.

In a theoretical sense, perhaps the most interesting aspect of the GIS program is that it represents one of the more clearcut examples of labor-management behavior that has fallen under the rubric of implicit contracting: because the incentives created by GIS plans extend the firm's interest in

its employees beyond layoffs through to the end of their working lives, the collective bargaining agreement implicitly becomes almost a lifetime contract.<sup>8</sup> Further, the firm has financial incentives to see that workers find well-paying jobs and the contractual right to ensure that workers accept suitable employment. In this sense, one might expect the firm to take on some of the functions of an employment agency: identifying potential jobs for its laid-off workers, setting up job interviews, perhaps counseling workers in order to improve their success in the job market, and determining the reasons for unsuccessful job search by some plan participants.

WHETHER GIS PLANS will spread to other industries as SUB plans did during the 1950's will depend largely on the pace of structural change in the economy. GIS plans provide protection from structural unemployment for senior employees in a way that SUBS and seniority-based layoffs cannot. If workers in other U.S. industries continue to feel threatened by large-scale layoffs and plant shutdowns in coming years, one might expect their unions to respond with demands for GIS-type programs. In any event, GIS plans represent an important innovation in labor-management relations and signal a renewed effort to address employment problems through the collective bargaining process. □

—FOOTNOTES—

<sup>1</sup>William M. Davis, "Collective bargaining in 1983: a crowded agenda," *Monthly Labor Review*, January 1983, pp. 3-16.

<sup>2</sup>D. Quinn Mills, "When Employees Make Concessions," *Harvard Business Review*, May-June 1983, pp. 103-13.

<sup>3</sup>*Business Week*, unpublished results of a June 14, 1982, survey.

<sup>4</sup>For a history of SUB plans and their development, see John Becker, *Guaranteed Income for the Unemployed* (Baltimore, Johns Hopkins Press, 1967).

<sup>5</sup>Peter Cappelli and Barry Nalebuff, "Supplemental Unemployment Benefit Plans and the Response of Employers," mimeo, January 1983.

<sup>6</sup>For a discussion of this position, see Herman Feldman, "The Annual Wage—Where Are We?" *American Economic Review*, December 1947, pp. 15-19.

<sup>7</sup>See Albert Rees and Harold W. Watts, "An Overview of the Labor Supply Results," in Joseph A. Pechman and P. Michael Timpane, eds., *Work Incentives and Income Guarantees: The New Jersey Negative Income Tax Experiment* (Washington, The Brookings Institution, 1975); and Gary Burtless and David Greenberg, "Measuring the Impact of Negative Income Tax Experiments on Work Effort," *Industrial and Labor Relations Review*, July 1983, pp. 592-605 for a review of these results.

<sup>8</sup>Workers continue to be covered by GIS as long as they maintain the required level of seniority. The requirements governing the loss of seniority while on layoff are complex and are subject to negotiation. Those workers currently eligible for the GIS program will continue to be covered by it even if the program is not renewed in future contracts. Questions about eligibility and benefit levels are answered by the joint board (chaired by an independent member) that administers the GIS program.

## Incentives in manufacturing: the carrot and the stick

FREDERIC L. PRYOR

To what degree do different incentives substitute for or complement each other in the manufacturing sector? Although this question has received considerable attention on the plant level, relatively little information is available on the subject for the U.S. manufacturing sector as a whole. This study presents the results of a small survey designed to elicit information so as to determine the contours of this important problem.

The study focuses on both positive and negative incentives, that is, the carrot and the stick. *Positive* incentive plans tie the compensation of the individual workers directly with the work that is done and are of two basic types: *Individual incentives* include piecework or various types of bonuses for exceeding norms; *Group incentives* tie the bonus to the performance of the group as a whole, for example, profit-sharing plans, stock ownership plans, bonuses based on aggregative indicators such as production or productivity. *Negative incentives* are threats or actual use of punishment, including financial penalties. These include the hiring of additional supervisors to monitor the performance of workers or firing workers for poor performance. Although some borderline cases can be cited for which it is difficult to determine whether a particular incentive is positive or negative, in most cases the distinction should be relatively clear.

For the most part, both positive and negative incentives are unilaterally imposed, that is management-controlled (but often constrained by union contracts), in contrast to quality circles and labor-management committees which are bilateral or cooperative efforts. I do not analyze these latter measures because they raise a set of considerations far from the major theme of this study.

Because both positive and negative incentives serve many of the same ends, they can be substitutes for each other. However, it is also possible that some incentives are complementary to each other. For instance, a high rate of supervision may lead to a high rate of firing (a conjecture not supported by the data below) or individual and group incentives may accompany each other (a proposition which does receive support). Current economic theory tells us little about such relations of complementarity or substitution; such an analysis must, therefore, be carried out primarily on an empirical level.

### The sample

A questionnaire consisting of about 65 questions was sent in the summer of 1981 to a stratified random sample of

2,050 U.S. manufacturing establishments and addressed to the production manager.<sup>1</sup> The questions focused on hourly plant employees and covered not only questions about incentives but also the opinions of the managers about the effectiveness of particular incentives and about the changes in the intensity of work.<sup>2</sup> Three hundred and sixty usable replies were received, and the final sample represents plants employing slightly less than 86,000 production workers (about 0.62 percent of total manufacturing workers). Although the survey is too small to offer conclusive results, a number of propositions are generated which warrant more extensive testing.

The characteristics of the plants in the sample parallel reasonably closely the characteristics of the total universe of U.S. manufacturing plants. The breakdown by two-digit industries (Standard Industrial Classification) is roughly similar to the United States as a whole.<sup>3</sup> The size distribution of plants is quite close to that of the total universe of American plants with 100 workers or more; however, workers in plants with 50 to 99 employees are underrepresented by 40 percent. Therefore, the results obtained should be considered only as reflecting conditions in larger plants and more impersonal working conditions. Geographical distribution of the plants in my survey appears quite similar to the country as a whole<sup>4</sup> and the percentage of unionized workers appears roughly the same as the entire manufacturing sector. In sum, although the sample is not perfect, it appears to reflect the broad structure of the U.S. manufacturing sector except, as intended, for very small plants.

The data collected differ from the compensation surveys of the Bureau of Labor Statistics in two important aspects. The BLS data focus on a narrow range of incentives at the level of the worker, whereas my data focus on a broad range of incentives at the level of plant (for any production workers within the plant).

### Positive incentives

Plant managers were asked if they had an incentive plan system for a large proportion of their hourly plant workers and, if so, which of a variety of specified methods they used. Summary results concerning the usage of such plans are presented in table 1.

Problems in presenting the data arise because many plants have more than one positive incentive plan; and in the most disaggregated classification (not given), those plants having plans with positive incentives averaged 1.4 different plans per plant. In the more aggregated classification presented in the table, roughly 30 percent of the plans report more than one type of incentive plan, and 16 percent of all plants (which cover 22 percent of the workers) have both personal and group incentive plans. This multiplicity of various positive incentive plans within a single plant suggest that *at the plant level*, such incentive systems are complementary. It appears likely, however, that *within the plant* different groups of workers may participate in different types of incentive

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**Table 1. Reported usage of incentive plans for production workers<sup>1</sup>**

[In percent]

Plans	Plants	Production workers
All plants	100	100
Plants with any incentive plans	54	59
With personal incentive plans	31	38
Piecework	16	17
Bonuses for exceeding norms <sup>2</sup>	16	23
Other <sup>3</sup>	2	1
With group incentive plans	32	33
Profit sharing or profit bonuses	21	12
Stock purchase	4	7
Bonuses based on aggregative indicators (production, sales, shipments)	9	14
Sharing cost savings, productivity increases	3	3
With miscellaneous plans	1	0

<sup>1</sup>The data for each category are presented net of all duplications. Hence, the sums of the parts are larger than the reported total, with the differences reflecting the extent to which various plants have several types of plans.

<sup>2</sup>These include plans based on "standard hour" or "standard day" as well as "individual production bonuses."

<sup>3</sup>These include bonuses for good attendance and base-pay increases for "good work."

schemes. For instance, assembly line workers might have group bonuses, while those in subsidiary activities might have individual bonuses.

If we examine the percentage of plants with positive incentive plans by industry, we find enormous variations in both personal and group incentives. In trying to understand this variation, I investigated a number of causal variables and the results can be briefly summarized.

- **Influence of labor unions:** There appears to be no significant relationship between the presence of a labor union and the existence of personal incentive plans; however, group incentive plans (especially profit-sharing or stock-ownership plans for blue-collar workers) are less likely to be found in plants with labor unions. For example, only 19 percent of plants with a majority of hourly workers which are unionized offered a group incentive plan, compared with 44 percent of plants with a majority of nonunion hourly workers.
- **Size of plant:** No interesting relationships were found except that profit-sharing or profit-bonus plans are used mostly in smaller plants.
- **Technology:** I asked the production managers to classify the technology of their plant into one of six types: traditional hand technology, general machining, assembly line, continuous flow technology, machine tending, and other. Only a few significant relations were found (for example, plants using continual process technologies have fewer personal incentive plans). I found no evidence to back Norma W. Carlson's contention<sup>5</sup> that personal incentive plans are less likely to be found in machine-paced production, although the difference in our results may lie in the fact that I tried to classify technology of individual

plants, while she characterized the type of technology using an industrial classification.

- **Cost effectiveness of such plans:** It is difficult to determine the cost effectiveness to the manufacturer of using such plans. However, it is noteworthy that the rank order of industries using piecework or personal incentive plans is highly correlated with a similar rank ordering of industry in France.<sup>6</sup> This suggests that use of certain technologies in the production of particular types of goods strongly influences the cost effectiveness of personal incentive plans.

### Negative incentives

I asked each manager to designate the number of hourly plant employees for each immediate supervisor. The results (which can be obtained from the author) show a statistically significant and positive relationship between the number of workers per supervisor and the size of the plant. For instance, 21 percent of the plants with fewer than 100 workers had 17 or more production workers per immediate supervisor, while 33 percent of plants with more than 500 workers had this low a degree of supervision. Other factors such as the degree of unionization, the type of technology, and so forth were not found to be statistically related to the degree of supervision.

Among the questions, I asked the production managers to rate the effectiveness of various types of incentives for increasing productivity. Of the 11 different measures provided in the list for that question, "more supervision of workers" numbered among the least effective. However, they did rank "more training of supervisory personnel" the single most effective measure to achieve higher productivity. This suggests that the managers consider the positive help that supervisors can give to their subordinates much more effective in raising productivity than the police role that the supervisors may play.

In addition, I asked the production managers to provide the percentage of workers "fired in the past year for poor job performance." The quantitative results examined by industry are quite similar to previously unpublished BLS surveys on the phenomenon.<sup>7</sup>

The most important causal factor underlying the rate of firing appears to be the degree of unionization. For instance, in plants with a majority of production workers unionized, 5 percent or more workers were annually fired in only 25 percent of the plants; among plants with a majority of non-union workers, this percentage was 44 percent. Such results parallel the findings of Charles Brown and James L. Medoff<sup>8</sup> and Richard B. Freeman<sup>9</sup>, who present quite different types of evidence showing that unionization is inversely related to labor turnover. This phenomenon is more dramatically seen when we examine changes in the rate of firing poor workers when the unionization status of workers has changed. For instance, in my sample, the rate of firing poor workers

increased over the last decade in 33 percent of the plants which are not unionized now but were unionized a decade ago; while this rate increased in only 20 percent of the plants which are now unionized but which were not unionized a decade ago. These results cannot tell us, however, whether the cause of this inverse relationship between labor turnover and unionization is due to the greater "voice" which union workers receive (an explanation offered by Freeman [1980], Brown and Medoff [1978] and others) or is due to union efforts to reduce the rate at which workers are fired.

Are the two types of negative incentives complements to each other (as are the two types of positive incentives) or substitutes? At a particular time, such a relationship cannot be easily seen; however, the time series data suggest strongly that they are substitutes. For instance, where the ratio of supervisors to production workers has increased over the last decade, the rate of firing increased in only 24 percent of the plants; where the degree of supervision has decreased over the last decade, the rate of firing has increased in 42 percent of them. This inverse relationship between changes in the degree of supervision and changes in the degree of firing poor workers means that if plants cannot (either because of pressure from labor unions or other considerations) encourage productivity by firing poor workers, they appear to increase the rate of supervision instead.

**Positive and negative incentives compared**

Analyzing the degree to which positive and negative incentives are substitutes or complements raises some problems. Because the two types of negative incentives appear to be substitutes for each other, aggregating them and comparing the results with the aggregate results of the positive incentives does not seem a fruitful way of attacking the problem. Instead, a more disaggregative approach is required.

The following is a comparison of some positive and negative incentives by presence of incentive plan and the number of production workers per immediate supervisor:

	Presence of personal in- centive plan		Presence of group incentive plan	
	Yes	No	Yes	No
Production workers per supervisor				
1 through 8	37	71	37	71
9 through 16	24	97	46	75
17 and over	42	57	20	79
	$x^2 = 13.5$		$x^2 = 8.6$	

The reported chi square statistics ( $x^2$ ) are uncorrected for the size of the sample. Both of the calculated statistics are significant at the .95 degree of confidence.

The above results suggest that there is a statistically significant inverse relationship between the use of incentive plans (particularly, individual incentive plans) and close supervision of workers. That is, the greater the use of in-

centive pay systems, the lower the degree of supervisor, and *vice versa*. The relationship is revealed not only at a single point in time but in other calculations where changes in the use of positive incentives and changes in the degree of supervision are examined over time.

Because intensive supervision and the rate of firing appear inversely related to each other and because intensive supervision and the presence of positive incentives also appear inversely related, we might expect to find a positive relationship between the rate of firing and the presence of positive incentives. Although this complementary relationship can, indeed, be found for *particular* types of positive incentives (for example, piecerate) and the rate of firing, such a positive relationship on an aggregative basis is not observed either at a single point in time or over time.

THIS SMALL SAMPLE SURVEY of the American manufacturing sector suggests that positive incentives (individual and group plans) are complementary to each other, that major negative incentives (the rate of supervision and the rate of firing) are substitutes for each other, and that the positive incentives and the rate of supervision are also substitutes for each other.

While it would be possible to carry out a similar survey on a much larger scale, more useful information could be gained if both plant and individual data could be obtained. That is, data on the types of workers within a given plant covered by particular types of incentives would be more useful than the plant data which I have collected. This information would provide a database permitting not only a much closer look at the suitability of particular types of incentives for particular types of workers but also would permit a closer monitoring of some important managerial efforts to increase productivity. Combined with data on plant performance, we could also begin the important task of assessing the *effectiveness* of particular types of incentives. □

—FOOTNOTES—

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All comparisons with U.S. manufacturing plants as a whole are made with the universe of plants in 1977, the last year for which detailed data were available to me. Almost all such comparisons are made with the census of manufacturing data for that year.

<sup>1</sup> The names of the plants were obtained from a direct mailing company whose master list was reported to contain 86 percent of all U.S. plants. To reduce the costs of the survey and to increase its coverage of total workers, the questionnaires were sent only to plants with more than 50 reported employees.

<sup>2</sup> The latter results are reported in Frederic L. Pryor, "Some Economics of Sloth," *The Social Science Review*, 5, No. 1 (Fall 1983), pp. 82-102.

<sup>3</sup>The average coverage of production workers is 0.624 percent; the standard deviation of this ratio among the 20 two-digit manufacturing industries is 0.242. The most underrepresented industry in the sample is leather and leather products (sic 31), followed by rubber and plastic products (sic 30), and then printing and publishing (sic 27). The most overrepresented industry is electrical machinery (sic 36), followed by stone, glass and clay products (sic 32) and then tobacco and tobacco products (sic 21). The last industry, although overrepresented by the number of workers, is represented only by one plant. In most of the statistical work underlying this study, I combined the most underrepresented industries into one group.

<sup>4</sup>The Northeast region is somewhat underrepresented and the Deep South is somewhat overrepresented. Otherwise, the representation of the nine census regions is very close to the national distribution.

<sup>5</sup>Norma W. Carlson, "Time rates tighten their grip on manufacturing industries," *Monthly Labor Review*, May 1982, pp. 15-23.

<sup>6</sup>Of the five industries in both the United States and France with the highest percentage of workers covered under such personal incentive plans, four are the same: textile (sic 22), apparel (sic 23), transportation equipment (sic 37), and nonelectrical machinery (sic 35). Of the five industries

in each nation with the least usage of such plans, four are the same: chemicals (sic 28), rubber and plastic products (sic 30), food and tobacco (sic 20 and 21 combined), and wood and furniture (sic 24 and 25 combined). The French data come from Elisabeth Vlassenko, "L'enquête sur la structure des salaires," *Economie et statistique*, No. 131 (March 1981), pp. 23-35; and *La structure des salaires dans l'industrie et les services en 1978* in *Les collection de l'INSEE, Séries M.*, No. 90-91 (March 1981).

<sup>7</sup>A former plant manager raised an interesting objection at this point—namely, that neither my data nor the BLS data on firing are very accurate because of ambiguities arising from treatment of the probationary period that each new worker serves. Before the end of this period, any worker can be "released" with ease; and it is unclear whether such actions are included in either the BLS or my data on fired workers because personnel on the probationary period are not, in a very real sense, regular workers.

<sup>8</sup>Charles Brown and James L. Medoff, "Trade Unions in the Production Process," *Journal of Political Economy*, 86, No. 3 (June 1978), pp. 355-78.

<sup>9</sup>Richard B. Freeman, "The Exit-Voice Tradeoff in the Labor Markets: Unions, Job Tenure, Quits, and Separations," *Quarterly Journal of Economics*, 94, No. 4 (June 1980), pp. 643-74.

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### Carnegie-Mellon honors BLS Commissioner

Commissioner of Labor Statistics Janet L. Norwood received an honorary Doctor of Laws degree May 14 from Carnegie-Mellon University. The citation read in part:

Economist and statistician, methodological innovator, manager and government leader . . . As Commissioner of the Bureau of Labor Statistics in this its Centennial year, she is the guardian of the nation's two most important statistical series—the unemployment rate and the consumer price index . . .

Her own words and actions present to us the model of a dedicated civil servant and true professional: a commitment to objectivity and fairness, an insistence on candor at all times, protection of confidentiality, the constant pursuit of improvement and a willingness to change, and finally the maintenance of the highest standards of performance at all times . . .

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# Major Agreements Expiring Next Month

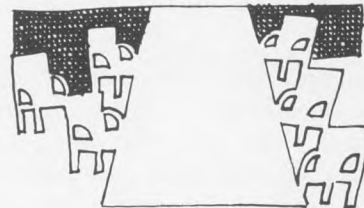
This list of selected collective bargaining agreements expiring in August is based on contracts on file in the Bureau's Office of Wages and Industrial Relations. The list includes agreements covering 1000 workers or more.

Employer and location	Industry	Labor organization <sup>1</sup>	Number of workers
Alabama Power Company (Alabama)	Utilities	Electrical Workers (IBEW)	3,700
American Bakeries Company and 2 others (New York and New Jersey)	Food products	Bakery and Tobacco Workers	1,000
Beech Aircraft Corp. (Kansas and Colorado)	Transportation equipment	Machinists	6,750
Champion International Corp., Champion Papers Division (Canton, N.C.)	Paper	Paperworkers	1,650
Colt Industries, Inc., Fairbanks Morse Engine Division (Beloit, Wis.)	Machinery	Steelworkers	1,150
Delaware Valley Set-Up Box Association (Pennsylvania)	Paper	Paperworkers	1,100
General Telephone Company of Florida (Florida)	Communication	Electrical Workers (IBEW)	8,800
Golden Gate Restaurant Association (California)	Restaurants	Hotel Employees and Restaurant Employees	3,500
Great Atlantic & Pacific Tea Company (Michigan)	Retail trade	United Food and Commercial Workers	1,000
Kroger Company, Detroit Branch (Michigan)	Retail trade	United Food and Commercial Workers	5,200
Leviton Manufacturing Company, Inc. (New York)	Electrical products	Electrical Workers (IBEW)	2,000
Maintenance Contractors agreement (Boston, Mass.) <sup>2</sup>	Services	Service Employees	6,000
Mechanical Contractors District of Columbia Association, Inc. (District of Columbia, Maryland, and Virginia)	Construction	Plumbers	2,100
Mechanical Contractors District of Columbia Association, Inc. (District of Columbia)	Construction	Plumbers	1,100
William Powell Company (Cincinnati, Ohio)	Fabricated metal products	Steelworkers	1,100

<sup>1</sup> Affiliated with AFL-CIO except where noted as independent (Ind.).

<sup>2</sup> Industry area (group of companies signing same contract).

# Developments in Industrial Relations



## First 1984 settlement in cement industry

Lone Star Industries, Inc. and the Cement, Lime, Gypsum and Allied Workers Division of the Boilermakers union negotiated the first settlement in the 1984 round of bargaining in the cement industry. In a deviation from past practice, the other companies did not soon settle on similar terms. The uncertainty about the course of bargaining was heightened by the union's strike against the various operations of Lehigh Portland Cement Co. A union official contended that the walkout was necessitated by a company effort "to break up pattern bargaining in the cement industry by blaming workers for the cement industry's problems." During the last few years, the industry has been beset by problems stemming from high energy costs and increased imports that have been manifested in company mergers and shut-downs.

The Lone Star accord reflected these conditions, providing for what the union called "minor gains in wages" of 25 cents an hour in each of the 3 years of the contract. The provision for automatic quarterly cost-of-living pay adjustments was continued, but the adjustments, which begin in 1985, are payable only if the Consumer Price Index rises more than 7 percent during a 12-month period.

Lone Star also agreed to a \$2 increase in the pension rate, in three steps, bringing it to \$22.50 a month for each year of credited service, and to a 10-cent increase in its 15-cent-an-hour financing of supplemental unemployment benefits.

Other benefit changes included the elimination of two of the 12 annual paid holidays in the first year. One of the holidays will be restored in the second year. Paid vacations also were reduced, beginning when employees move from one length of service step to the next (such as from the 5-year step to the 10-year step).

## Aerospace accord

In the aerospace industry, 9,600 workers in St. Louis, Mo., were covered by a settlement between McDonnell Douglas Corp. and the Machinists union. The 3-year accord was patterned after the company's earlier settlements with the Machinists and Auto Workers unions for the West Coast

operations. (See *Monthly Labor Review*, April 1984, p. 49.)

The terms included —

- No specified pay adjustments except for increases of 5, 21, or 22 cents for employees in the highest grades.
- Annual lump-sum payments equal to 3 percent of pay during the preceding 12 months.
- Continuation of automatic quarterly cost-of-living pay adjustments, now limited to the highest paid 75 percent of the workers.
- Lower pay rates for new employees.
- A revision of the health insurance plan requiring employees to begin contributing \$2 a week for single coverage and \$4 for family coverage, with each amount rising by 20 cents in both the second and third contract years.
- An increase in the pension rate to \$17 a month for each year of past service and \$20 for each year of future service, from \$15 for all service. The workers also received a refund of contributions they had made prior to 1969, when the pension plan became fully company paid. The refund ranged up to \$5,600 for some workers.
- Increased life insurance and an improved savings plan.

## NLRB decisions

The National Labor Relations Board announced two decisions unfavorable to organized labor.

In one decision, the board held that the National Labor Relations Act should not preclude managers from asking workers about union organizing activities or union sympathies. This was a return to the guiding principle of labor law that had prevailed until 1980, when the board expanded the types of management contacts with employees that would be viewed as intimidation.

In its 3 to 1 ruling, the board held that the 1980 decision "improperly established a per se rule that completely disregarded the circumstances surrounding an alleged interrogation."

The 1984 ruling, which reversed the decision of an administrative law judge, involved the Hotel Employees and Restaurant Employees union and Rossmore House, a private retirement home in California. According to the union, managers of the home had violated the National Labor Relations Act by questioning Warren Harvey, an employee who had informed them he was attempting to organize fellow em-

"Developments in Industrial Relations" is prepared by George Ruben of the Division of Developments in Labor-Management Relations, Bureau of Labor Statistics, and is largely based on information from secondary sources.

ployees. The company did not deny that the managers had questioned Harvey and had expressed their determination to resist the organizing effort, but contended that they made no coercive or threatening statements.

The dissenting opinion came from Donald Zimmerman, who said that the majority ruling "ignores the reality that employers sometimes use subtle coercion during an organizing campaign and fails to recognize that even open union adherents may be intimidated by such coercion."

In the other decision, the board held that it cannot order an employer who has committed unfair labor practices to negotiate with a union that is not supported by a majority of the workers in the bargaining unit. This reversed the position the board had taken in 1982 in another case.

The current ruling reversed the finding of an administrative law judge who had ruled that Gourmet Foods Inc. committed a number of unfair labor practices to thwart an organizing drive by the Teamsters and, therefore, should be required to bargain with the union, even though the union was not supported by a majority of the employees. According to the judge, the specialty foods company's tactics had included threats to fire its employees and close the plant, located in St. Paul, Minn.

In its 3 to 1 decision, the board said the bargaining order issued in the 1982 case involving Conair Corp. a New Jersey firm, was improper because it amounted to "governmental imposition of a choice of representatives." The board also said that the majority-rule principle is fundamental to the workers' right to choose a union and must be maintained even in the most "exceptional" cases.

The dissent again came from board member Zimmerman who noted a 1969 Supreme Court decision that identified a class of unfair labor practices so coercive in nature that they prevented union elections from being held. He said that if the board does not use its power to correct such practices, it fails in its duty to "preserve employee rights to self organization and free choice of a collective bargaining representative."

### Supreme Court rules on agency shop fees

In a setback for organized labor, the Supreme Court restricted the activities that unions in the railroad and airline transportation industries may finance using fees obtained from workers who object to the expenditures. The Court's interpretation of the Railway Labor Act applies only to workers who are represented by a union in collective bargaining but are not members of the union. The money at question is the so-called "agency shop fee" paid by "non-members" in lieu of the dues paid by fellow employees who are members of the union.

In the ruling, written by Justice Byron White, the Court said that if an employee objects, the employee's agency shop payments cannot be used for organizing other workers or for paying union legal expenses for lawsuits over issues

not specifically related to the bargaining agreement covering the workers. However, the Justices said it is improper for a union to collect money from all employees it represents and then refund a portion of agency shop fees to employees who object to certain uses of the money. The Court said this amounted to involuntary loans to the union.

The impact on unions was reduced somewhat by the Justices' conclusion that, even if employees object, dues and agency shop fees can be used for conventions at which union officers are elected and bargaining goals are set, for refreshments and social activities at business meetings of local unions, and for union publications, except articles regarding political activity.

In a partial dissent, Justice Lewis Powell contended that convention costs should not be charged to agency shop fees.

Union attorneys said the decision was limited because it does not apply to workers in other industries who are covered by the National Labor Relations Act; because it does not limit spending for conventions, the largest expenditure of the union involved in the case; and because comingling of agency shop fees and dues for all purposes is legal unless dissenters inform the union of their objection.

The case, *Ellis v. Brotherway of Railway Clerks*, was initiated by employees of Western Airlines who sued over use of the agency shop payments they were making to the union.

### Law firms not exempt from Title VII

The Supreme Court held that a law firm must comply with Federal anti-discrimination laws when deciding which members of the firm should be elevated to partners. The ruling also means that firms with more than 15 employees will be subject to scrutiny by the Equal Employment Opportunity Commission, which enforces the law, Title VII of the Civil Rights Act of 1964. (Title VII bars discrimination in hiring and firing in any "terms, conditions or privileges of employment" because of a person's race, sex, religion, or national origin.)

The case began in 1980, when Elizabeth Anderson Hishon sued her former employer, the Atlanta law firm of King and Spalding, asserting that it had engaged in sex discrimination when it passed her over for partnership. According to Hishon, when she started with the firm in 1972 she had been promised that she would be considered "on a fair and equal basis" for partnership. The Supreme Court said this promise may have created a contract which Hishon can try to prove was violated. The Court remanded the case to Federal District Court in Atlanta for trial.

The law firm argued before the Supreme Court that Title VII did not apply to the case because selection of partners is a business decision rather than an employer-employee relationship. The unanimous decision, written by Chief Justice Warren Burger, said that there was no historical evidence that the Congress meant to exempt law firms from



Title VII coverage. Burger said the possibility of becoming a partner "may qualify as a privilege of employment" that "may not be doled out in a discriminatory fashion."

Hishon, now a partner in another Atlanta law firm, asked for damages and back pay from King and Spalding. In 1978, when she was passed over for partnership, King and Spalding had never had a female partner. Currently, two of its 64 partners are women. A survey of large law firms conducted by the National Journal newspaper showed that women make up 30.4 percent of all associates in the firms, but only 5 percent of the partners.

### Public utility settlements

In the electric power industry, Public Service Co. of Indiana and the International Brotherhood of Electrical Workers (IBEW) negotiated a 1-year extension of an agreement scheduled to expire on April 30. The settlement did not provide for any changes in wages or benefits for the 2,200 workers.

The IBEW also settled with Central Maine Power Co. for more than 1,000 workers. The 2-year contract provided for 3 percent pay increases at the beginning of each contract year. Benefit changes included adoption of a savings and investment plan and adoption of a \$100 annual deductible for basic medical benefits.

In New Jersey, Public Service Electric and Gas Co. and three unions negotiated 3-year contracts that called for wage increases of 5.32, 5.05, and 6 percent on May 1 of 1984, 1985, and 1986, respectively. Other terms for the 7,300 workers included increased pension benefits and adoption of prescription drug plan. The unions were the IBEW, the Plumbers and Pipefitters, and the Utility Co. Workers Association.

Seven thousand employees of Southern California Gas Co. were covered by 2-year contracts with the Utility Workers and Chemical Workers unions that called for a 6-percent pay increase in the first year and a 5.5-percent increase in the second. Prior to settlement, their pay averaged \$12.04 an hour. A provision for automatic cost-of-living pay adjustments was terminated, and annual health insurance deductibles paid by workers were raised to \$200, from \$100.

In Pennsylvania, 1,100 workers were covered by a settlement between West Penn Power Co. and the Utility Workers. The accord provided for a 5-percent increase in all pay rates except starting rates for new employees, which were not changed. The bargaining was conducted under a wage reopening provision of a contract scheduled to expire in 1986.

### Insurance contract features new pension plan

Metropolitan Life Insurance Co. and the Professional Insurance, Finance and Health Care Division of the United

Food and Commercial Workers negotiated a 3-year contract that included provisions for a new pension plan and for moderating the company's cost for health insurance.

The new pension plan, established under Section 401(k) of the Internal Revenue Code, permits the 3,000 insurance agents to defer taxes on their 3-percent (of earnings) contributions into the pension plan until they begin drawing money from the plan at age 59½ or later. Metropolitan also contributes an equal amount to the basic plan. The plan is linked to the existing savings and investment plan enabling the agents to designate an additional 1 to 10 percent of their earnings into either the basic plan or the savings and investment plan, or to divide the amount between each.

The provisions to hold down health care costs include a \$356 annual deductible for individuals and \$712 for families, and 90 percent payment for most medical expenses. The exceptions include 100 percent reimbursement, with no deductible, for surgery, preadmission testing, home health care, hospice care, and confinement in extended care facilities; no reimbursement of hospital room and board charges for Fridays and Saturdays if admissions on those days are not of an emergency nature; and 100 percent reimbursement with no deductible for second surgical opinions. (If an employee does not obtain a second opinion for certain non-emergency surgical procedures, the plan only covers 50 percent of the cost above the deductible.)

Under the previous plan, there was a \$100 deductible for out-of-hospital expenses and the company paid 80 percent of any additional expense. In-hospital expenses were fully covered if they did not exceed reasonable and customary charges

In any case, under the new contract the maximum annual cost to an employee for deductibles and coinsurance will equal 5 percent of annual income, with a minimum of \$750 and maximum of \$2,500.

The employee contribution toward health insurance was changed to \$2.50 a week for self-only coverage and \$6 a week for family coverage. Previously, agents with 3 years or more of service paid \$1.25 for self-only coverage and \$3 for family coverage, and those with less service paid \$2.75 for self-only coverage and \$6 for family coverage.

The company also established a division to aid the agents in selling group insurance to employees in large national organizations such as business firms and trade associations. In conjunction with this action, the parties agreed on a schedule of payments to the agents for the various activities involved in selling the coverage.

The parties also agreed on a new commission schedule that pays larger percentage amounts to employees who sell a broad line of policies rather than concentrating on a few types.

# Book Reviews

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## The transformation of work

*The Work Revolution.* By Gail Garfield Schwartz and William Neikirk. New York, Rawson Associates, 1983. 255 pp. \$14.95.

Changes in technology, international trade patterns, and immigration flows are all part of a "work revolution" in the United States. The number and kinds of jobs, workplace interactions, skill requirements, and education and training resources have been, or will be, affected by these changes. The authors—Gail Garfield Schwartz, a Washington-based economic consultant, and William Neikirk, the *Chicago Tribune's* economic correspondent—feel that the problems surrounding these changes have not been well defined and that outdated solutions have been applied in an effort to resolve them. Drawing from their own knowledge, as well as that of other researchers, they raise important policy issues about, and offer solutions to, a topical and immediate concern—structural change in the American economy. The main theme throughout the narrative is "what was true in the past is not going to be true in the future." But strict adherence to this philosophy does not always serve the authors; history is often the best teacher.

The primary purpose of the book is to provide a glimpse of the future of work from the authors' viewpoint. In the first half of the book, the authors attempt to qualify and somewhat quantify the depth of the job crisis that will be experienced by American workers as a result of a growth in factory and office automation, imports, and the illegal immigrant work force. Although the book is very informative, some of the findings are loosely substantiated and rest more on conjecture than fact. However, information on how future workers should proceed with their education and their job search is of considerable value. The acquisition of transferable skills, applicable to a broad range of jobs is recommended. An example given is computer competence.

The technological revolution in information management and communication is the force behind the new "knowledge-based economy." The authors argue that changes will spread rapidly and echo the agricultural revolution and not the industrial revolution. That is, the trend will be much higher output with fewer workers. Worker displacement will greatly exceed job creation. However, the authors offer no persuasive evidence that the increase in technology will have

such a rapid impact on the work force. They assume that the escalating cost of capital relative to labor will not inhibit the substitution of capital for labor in the workplace. For example, the exorbitant cost of robotic technology, especially to small and medium size firms, raises reasonable doubt that this indeed will be the case. Also, the less dramatic findings of the employment effects of robotics and microelectronics reported in other studies are dismissed rather nonchalantly. Frequently, only one side of an argument is presented. For example, the authors discuss the American-made products assembled outside our borders but fail to mention the growing number of American workers who assemble foreign cars and other foreign products in the United States.

In the authors' view, the impact of technological change will be greater than in the past because service sector automation will impede the traditional flow of workers from goods to services. The supportive evidence is representative of the analysis in the first half of the book. No consistent time period was analyzed, and there is a tendency to confuse cyclical (short run) changes with structural (long run) changes. The authors note, for example, that between 1973 and 1976 (primarily a recessionary period), employment growth in the banking industry averaged 3.2 percent, compared with 4.5 percent between 1960 and 1973. Therefore, they concluded that computer technology in the industry was slowing employment growth. Not noted, however, is that post-1976 employment growth in the banking industry has averaged more than 4.5 percent annually.

"The whole technology threat would be much more manageable if it were not for another big job threat—foreign competition." The authors touch on a number of important international issues—technological dispersion, protectionism, and lower foreign compensation levels to name a few—that may affect domestic employment. They suggest a strategy of specialization; that is, we should place more emphasis on the more sophisticated forms of technology. New high-tech professional jobs would create as many, if not more, jobs in support industries, although they downplay the extent of this relationship.

Estimating the number and kinds of jobs offers a real challenge. Occupational projections by the Bureau of Labor Statistics (BLS) for the 1990's are heavily criticized. In the author's words, "That initial (BLS) job projections proved

to be in error is no accident. These forecasts are derived on the basis of assumptions that are debatable at best." True, the well-documented BLS projections were off the mark in the early 1980's, probably because of the recession. Besides failing to note the recession, the authors neglected to point out that BLS projections include three trend scenarios—high, moderate, and low—in which the underlying assumptions about each trend vary. Some of the assumptions in the alternative specifications are the same as those suggested by the authors. Although they present alternative occupational projections, there is no way to evaluate them. Neither the methodology nor the underlying assumptions are provided. Interestingly, the authors use BLS projections when the data support a specific argument or finding.

In the chapter, "Who Works? The War Over Jobs," the authors contend that "the diminishing stream of youth will be offset by a growing number of immigrants and older women in the work force, and older male workers will stay in the work force longer." That is, there will be fewer job opportunities throughout the labor force. But recent labor force participation trends show a continuing decline in participation among men, especially those over 55 years, while the upward trend in women's participation has slowed. Basically, the whole squeezing opportunity notion rests on trends in immigration. Illegal immigration flows are difficult to measure accurately. Even the authors' projection of legal immigration may be somewhat high because it is based on the 1980–81 period when an unusually large number of Southeast Asian refugees entered the country.

In the last half of the book, the authors turn from trying to persuade the reader of the extent of the job crisis to what can be done about it. "What are the chances that a 35- to 40-year-old man who has toiled in a factory job all his working life can be successfully retrained to find another job in another industry?" The authors believe that the solution is more jobs and more leisure (shorter workweek), with an emphasis on innovation and discovery and a revamped educational system attuned to teaching analytical skills.

The ability of a shortened workweek to reduce unemployment is overstated. It is "not a one job created, one less unemployed person," proposition. The authors' estimates fail to recognize the dynamic aspects of the labor market. Specifically, a shortened workweek will, in all probability, increase the flow of people from outside the labor force to the work force. Many part-time workers, especially those already seeking full-time work, may bid for these jobs. The number of multiple jobholders may also increase. That is, many of the new jobs created by a shortened workweek will be filled by existing workers or from people outside the labor force.

In coping with the work revolution, the authors view the government's role as follows: (1) provide information that helps match skills with available jobs; (2) assist people in financing their education or training through a loan program,

if necessary; and (3) provide jobs that will benefit the common welfare of the country. The second idea seems to be the most innovative in that it is open to all workers. Although the last idea sounds like a Public Service Employment program, the authors claim that it is different because it is not limited in scope and mission. They envision the creation of "public-interest jobs" to rebuild the vast infrastructure of American life from bridge and road repair to providing adequate health care to the poor and the elderly. Costs would be offset by an increase in tax revenues through tax reform and through the larger number of jobholders which, in turn, would mean less welfare and unemployment insurance benefit outlays.

The question of how to finance public-interest jobs is treated only superficially. The authors admit that "the complexities involved in changing tax law are much beyond the scope of this book." Moreover, there are other unaddressed questions bearing on overall program cost such as how many people will need training to fill public-interest jobs and who will provide and pay for it.

"Ringing the job crisis alarm also signals new opportunities." A high-tech society can use its technology to prepare for it, although the work revolution and job crisis is less dire than the limited evidence presented here suggests.

—ROBERT W. BEDNARZIK  
Division of Foreign Economic Research  
Bureau of International Labor Affairs

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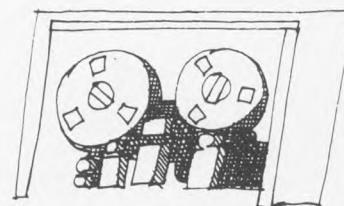
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# Current Labor Statistics



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## NOTES ON CURRENT LABOR STATISTICS

This section of the *Review* presents the principal statistical series collected and calculated by the Bureau of Labor Statistics. A brief introduction to each group of tables provides definitions, notes on the data, sources, and other material usually found in footnotes.

Readers who need additional information are invited to consult the BLS regional offices listed on the inside front cover of this issue of the *Review*. Some general notes applicable to several series are given below.

**Seasonal adjustment.** Certain monthly and quarterly data are adjusted to eliminate the effect of such factors as climatic conditions, industry production schedules, opening and closing of schools, holiday buying periods, and vacation practices, which might otherwise mask short-term movements of the statistical series. Tables containing these data are identified as "seasonally adjusted." Seasonal effects are estimated on the basis of past experience. When new seasonal factors are computed each year, revisions may affect seasonally adjusted data for several preceding years.

Seasonally adjusted labor force data in tables 3-8 were revised in the February 1984 issue of the *Review*, to reflect experience through 1983.

Beginning in January 1980, the BLS introduced two major modifications in the seasonal adjustment methodology for labor force data. First, the data are being seasonally adjusted with a new procedure called X-11/ARIMA, which was developed at Statistics Canada as an extension of the standard X-11 method. A detailed description of the procedure appears in *The X-11 ARIMA Seasonal Adjustment Method* by Estela Bee Dagum (Statistics Canada Catalogue No. 12-564E, February 1980). The second change is that seasonal factors are now being calculated for use during the first 6 months of the year, rather than for the entire year, and then are calculated at mid-year for the July-December period. Revisions of historical data continue to be made only at the end of each calendar year.

Annual revision of the seasonally adjusted payroll data shown in tables 11, 13, and 15 were made in July 1984 using the X-11 ARIMA seasonal adjustment methodology. New seasonal factors for productivity data in tables 29 and 30 are usually introduced in the September issue. Seasonally adjusted indexes and percent changes from month to month and from

quarter to quarter are published for numerous Consumer and Producer Price Index series. However, seasonally adjusted indexes are not published for the U.S. average. All Items CPI. Only seasonally adjusted percent changes are available for this series. **Adjustments for price changes.** Some data are adjusted to eliminate the effect of changes in price. These adjustments are made by dividing current dollar values by the Consumer Price Index or the appropriate component of the index, then multiplying by 100. For example, given a current hourly wage rate of \$3 and a current price index number of 150, where 1967 = 100, the hourly rate expressed in 1967 dollars is \$2 ( $\$3/150 \times 100 = \$2$ ). The resulting values are described as "real," "constant," or "1967" dollars.

**Availability of information.** Data that supplement the tables in this section are published by the Bureau of Labor Statistics in a variety of sources. Press releases provide the latest statistical information published by the Bureau; the major recurring releases are published according to the schedule given below. More information from household and establishment surveys is provided in *Employment and Earnings*, a monthly publication of the Bureau. Comparable household information is published in a two-volume data book—*Labor Force Statistics Derived From the Current Population Survey*, Bulletin 2096. Comparable establishment information appears in two data books—*Employment and Earnings, United States*, and *Employment and Earnings, States and Areas*, and their annual supplements. More detailed information on wages and other aspects of collective bargaining appears in the monthly periodical, *Current Wage Developments*. More detailed price information is published each month in the periodicals, the *CPI Detailed Report* and *Producer Prices and Price Indexes*.

### Symbols

- p = preliminary. To improve the timeliness of some series, preliminary figures are issued based on representative but incomplete returns.
- r = revised. Generally, this revision reflects the availability of later data but may also reflect other adjustments.
- n.e.c. = not elsewhere classified.

**Schedule of release dates for BLS statistical series**

Series	Release date	Period covered	Release date	Period covered	Release date	Period covered	MLR table number
Employment situation	July 6	June	August 3	July	September 7	August	1-11
Producer Price Index	July 13	June	August 10	July	September 14	August	23-27
Consumer Price Index	July 24	June	August 22	July	September 21	August	19-22
Real earnings	July 24	June	August 22	July	September 21	August	12-16
Major collective bargaining settlements	July 27	1st half					36-37
Productivity and costs:							
Nonfinancial corporations			August 27	2nd quarter			29-32
Nonfarm business and manufacturing	July 31	2nd quarter					29-32
Employment Cost Index	July 31	2nd quarter					33-35
Occupational injuries and illnesses					November 14	1983	

## EMPLOYMENT DATA FROM THE HOUSEHOLD SURVEY

EMPLOYMENT DATA in this section are obtained from the Current Population Survey, a program of personal interviews conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. The sample consists of about 60,000 households selected to represent the U.S. population 16 years of age and older. Households are interviewed on a rotating basis, so that three-fourths of the sample is the same for any 2 consecutive months.

### Definitions

**Employed persons** include (1) all civilians who worked for pay any time during the week which includes the 12th day of the month or who worked unpaid for 15 hours or more in a family-operated enterprise and (2) those who were temporarily absent from their regular jobs because of illness, vacation, industrial dispute, or similar reasons. Members of the Armed Forces stationed in the United States are also included in the employed total. A person working at more than one job is counted only in the job at which he or she worked the greatest number of hours.

**Unemployed persons** are those who did not work during the survey week, but were available for work except for temporary illness and had looked for jobs within the preceding 4 weeks. Persons who did not look for work because they were on layoff or waiting to start new jobs within the next 30 days are also counted among the unemployed. The **overall unemployment rate** represents the number unemployed as a percent of the labor force, including the resident Armed Forces. The **unemployment**

**rate** for all civilian workers represents the number unemployed as a percent of the civilian labor force.

The **labor force** consists of all employed or unemployed civilians plus members of the Armed Forces stationed in the United States. Persons **not in the labor force** are those not classified as employed or unemployed; this group includes persons who are retired, those engaged in their own housework, those not working while attending school, those unable to work because of long-term illness, those discouraged from seeking work because of personal or job market factors, and those who are voluntarily idle. The **noninstitutional population** comprises all persons 16 years of age and older who are not inmates of penal or mental institutions, sanitariums, or homes for the aged, infirm, or needy, and members of the Armed Forces stationed in the United States. The **labor force participation rate** is the proportion of the noninstitutional population that is in the labor force. The **employment-population ratio** is total employment (including the resident Armed Forces) as a percent of the noninstitutional population.

### Notes on the data

From time to time, and especially after a decennial census, adjustments are made in the Current Population Survey figures to correct for estimating errors during the preceding years. These adjustments affect the comparability of historical data presented in table 1. A description of these adjustments and their effect on the various data series appear in the Explanatory Notes of *Employment and Earnings*.

Data in tables 2-8 are seasonally adjusted, based on the seasonal experience through December 1983.

**1. Employment status of the noninstitutional population, 16 years and over, selected years, 1950-83**

[Numbers in thousands]

Year	Noninstitutional population	Labor force										Not in labor force
		Number	Percent of population	Employed						Unemployed		
				Total	Percent of population	Resident Armed Forces	Civilian			Number	Percent of labor force	
							Total	Agriculture	Nonagricultural industries			
1950	106.164	63.377	59.7	60.087	56.6	1.169	58.918	7.160	51.758	3.288	5.2	42.787
1955	111.747	67.087	60.0	64.234	57.5	2.064	62.170	6.450	55.722	2.852	4.3	44.660
1960	119.106	71.489	60.0	67.639	56.8	1.861	65.778	5.458	60.318	3.852	5.4	46.617
1965	128.459	76.401	59.5	73.034	56.9	1.946	71.088	4.361	66.726	3.366	4.4	52.058
1966	130.180	77.892	59.8	75.017	57.6	2.122	72.895	3.979	68.915	2.875	3.7	52.288
1967	132.092	79.565	60.2	76.590	58.0	2.218	74.372	3.844	70.527	2.975	3.7	52.527
1968	134.281	80.990	60.3	78.173	58.2	2.253	75.920	3.817	72.103	2.817	3.5	53.291
1969	136.573	82.972	60.8	80.140	58.7	2.238	77.902	3.606	74.296	2.832	3.4	53.602
1970	139.203	84.889	61.0	80.796	58.0	2.118	78.678	3.463	75.215	4.093	4.8	54.315
1971	142.189	86.355	60.7	81.340	57.2	1.973	79.367	3.394	75.972	5.016	5.8	55.834
1972	145.939	88.847	60.9	83.966	57.5	1.813	82.153	3.484	78.669	4.882	5.5	57.091
1973	148.870	91.203	61.3	86.838	58.3	1.774	85.064	3.470	81.594	4.355	4.8	57.667
1974	151.841	93.670	61.7	88.515	58.3	1.721	86.794	3.515	83.279	5.156	5.5	58.171
1975	154.831	95.453	61.6	87.524	56.5	1.678	85.845	3.408	82.438	7.929	8.3	59.377
1976	157.818	97.826	62.0	90.420	57.3	1.668	88.752	3.331	85.421	7.406	7.6	59.991
1977	160.689	100.665	62.6	93.673	58.3	1.656	92.017	3.283	88.734	6.991	6.9	60.025
1978	153.541	103.882	63.5	97.679	59.7	1.631	96.048	3.387	92.661	6.202	6.0	59.659
1979	166.460	106.559	64.0	100.421	60.3	1.597	98.824	3.347	95.477	6.137	5.8	59.900
1980	169.349	108.544	64.1	100.907	59.6	1.604	99.303	3.364	95.938	7.637	7.0	60.806
1981	171.775	110.315	65.2	102.042	59.4	1.645	100.397	3.368	97.030	8.273	7.5	61.460
1982	173.939	111.872	64.3	101.194	58.2	1.668	99.526	3.401	96.125	10.578	9.5	62.067
1983	175.891	113.226	64.4	102.510	58.3	1.676	100.834	3.383	97.450	10.717	9.5	62.665



**2. Employment status of the population, including Armed Forces in the United States, by sex, seasonally adjusted**

[Numbers in thousands]

Employment status and sex	Annual average		1983									1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
<b>TOTAL</b>																
Noninstitutional population <sup>1,2</sup>	173,939	175,465	175,622	175,793	175,970	176,122	176,297	176,474	176,636	176,809	177,219	177,363	177,510	177,662	177,813	
Labor force <sup>2</sup>	111,872	112,646	112,619	113,573	113,489	113,799	113,924	113,561	113,720	113,824	113,901	114,377	114,598	114,938	115,493	
Participation rate <sup>3</sup>	64.3	64.2	64.1	64.6	64.5	64.6	64.6	64.3	64.4	64.4	64.3	64.5	64.6	64.7	65.0	
Total employed <sup>2</sup>	101,194	101,277	101,431	102,411	102,889	103,166	103,571	103,665	104,291	104,629	104,876	105,576	105,826	106,095	106,978	
Employment-population rate <sup>4</sup>	58.2	57.7	57.8	58.3	58.5	58.6	58.7	58.7	59.0	59.2	59.2	59.5	59.6	59.7	60.2	
Resident Armed Forces <sup>1</sup>	1,668	1,671	1,669	1,668	1,664	1,682	1,695	1,695	1,685	1,688	1,686	1,684	1,686	1,693	1,690	
Civilian employed	99,526	99,606	99,762	100,743	101,225	101,484	101,876	101,970	102,606	102,941	103,190	103,892	104,140	104,402	105,288	
Agriculture	3,401	3,392	3,374	3,479	3,499	3,449	3,308	3,240	3,257	3,356	3,271	3,395	3,281	3,393	3,389	
Nonagricultural industries	96,125	96,214	96,388	97,264	97,726	98,035	98,568	98,730	99,349	99,585	99,918	100,496	100,859	101,009	101,899	
Unemployed	10,678	11,369	11,188	11,162	10,600	10,633	10,353	9,896	9,429	9,195	9,026	8,801	8,772	8,843	8,514	
Unemployment rate <sup>5</sup>	9.5	10.1	9.9	9.8	9.3	9.3	9.1	8.7	8.3	8.1	7.9	7.7	7.7	7.7	7.4	
Not in labor force	62,067	62,819	63,003	62,220	62,481	62,323	62,373	62,913	62,916	62,985	63,318	62,986	62,912	62,724	62,320	
<b>Men, 16 years and over</b>																
Noninstitutional population <sup>1,2</sup>	83,052	84,064	83,931	84,014	84,099	84,173	84,261	84,344	84,423	84,506	84,745	84,811	84,880	84,953	85,024	
Labor force <sup>2</sup>	63,979	64,580	64,348	64,778	64,840	64,807	64,877	64,709	64,846	64,838	64,930	65,093	65,156	65,212	65,307	
Participation rate <sup>3</sup>	77.0	76.8	76.7	77.1	77.1	77.0	77.0	76.7	76.8	76.7	76.6	76.8	76.8	76.8	76.8	
Total employed <sup>2</sup>	57,800	58,320	57,744	58,369	58,592	58,607	58,828	58,950	59,389	59,580	59,781	60,147	60,290	60,293	60,629	
Employment-population rate <sup>4</sup>	69.6	69.4	68.8	69.5	69.7	69.6	69.8	69.9	70.3	70.5	70.5	70.9	71.0	71.0	71.3	
Resident Armed Forces <sup>1</sup>	1,527	1,533	1,528	1,525	1,521	1,538	1,549	1,543	1,534	1,537	1,542	1,540	1,542	1,548	1,545	
Civilian employed	56,271	56,787	56,216	56,844	57,071	57,069	57,279	57,407	57,855	58,043	58,239	58,607	58,748	58,745	59,084	
Unemployed	6,179	6,260	6,604	6,409	6,248	6,200	6,049	5,759	5,457	5,258	5,149	4,946	4,867	4,919	4,678	
Unemployment rate <sup>5</sup>	9.7	9.7	10.3	9.9	9.6	9.6	9.3	8.9	8.4	8.1	7.9	7.6	7.5	7.5	7.2	
<b>Women, 16 years and over</b>																
Noninstitutional population <sup>1,2</sup>	90,887	91,827	91,691	91,779	91,871	91,949	92,036	92,129	92,214	92,302	92,474	92,552	92,630	92,709	92,789	
Labor force <sup>2</sup>	47,894	48,646	48,271	48,795	48,649	48,992	49,047	48,852	48,874	48,986	48,971	49,283	49,442	49,725	50,186	
Participation rate <sup>3</sup>	52.7	53.0	52.6	53.2	53.0	53.3	53.3	53.0	53.0	53.1	53.0	53.2	53.4	53.6	54.1	
Total employed <sup>2</sup>	43,395	44,190	43,687	44,042	44,297	44,559	44,743	44,715	44,902	45,049	45,094	45,429	45,536	45,802	46,350	
Employment-population rate <sup>4</sup>	47.7	48.1	47.6	48.0	48.2	48.5	48.6	48.5	48.7	48.8	48.8	49.1	49.2	49.4	50.0	
Resident Armed Forces <sup>1</sup>	139	143	141	143	143	144	146	152	151	151	144	144	144	145	145	
Civilian employed	43,256	44,047	43,546	43,899	44,154	44,415	44,597	44,563	44,751	44,898	44,950	45,285	45,392	45,657	46,205	
Unemployed	4,499	4,457	4,584	4,753	4,352	4,433	4,304	4,137	3,972	3,937	3,876	3,855	3,905	3,924	3,836	
Unemployment rate <sup>5</sup>	9.4	9.2	9.5	9.7	8.9	9.0	8.8	8.5	8.1	8.0	7.9	7.8	7.9	7.9	7.6	

<sup>1</sup>The population and Armed Forces figures are not adjusted for seasonal variation.

<sup>2</sup>Includes members of the Armed Forces stationed in the United States.

<sup>3</sup>Labor force as a percent of the noninstitutional population.

<sup>4</sup>Total employed as a percent of the noninstitutional population.

<sup>5</sup>Unemployment as a percent of the labor force (including the resident Armed Forces).







## 6. Unemployment rates by sex and age, seasonally adjusted

[Civilian workers]

Sex and age	Annual average		1983								1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Total, 16 years and over	9.7	9.6	10.1	10.0	9.5	9.5	9.2	8.8	8.4	8.2	8.0	7.8	7.8	7.8	7.5
16 to 24 years	17.8	17.2	18.0	17.6	16.8	17.2	16.5	16.3	15.4	14.9	14.8	14.2	14.4	14.6	14.0
16 to 19 years	23.2	22.4	23.0	23.6	22.7	22.8	21.8	21.6	20.2	20.1	19.4	19.3	19.9	19.4	19.0
16 to 17 years	24.9	24.5	25.6	25.6	25.1	24.8	24.0	24.0	21.9	22.9	21.9	22.1	23.1	22.3	20.2
18 to 19 years	22.1	21.1	21.3	22.3	20.8	21.6	20.5	20.3	19.3	18.8	17.6	17.5	18.1	17.5	18.2
20 to 24 years	14.9	14.5	15.5	14.5	13.9	14.4	13.8	13.6	13.0	12.2	12.5	11.6	11.6	12.2	11.5
25 years and over	7.4	7.5	7.9	7.9	7.4	7.3	7.2	6.8	6.5	6.4	6.2	6.1	5.9	6.0	5.7
25 to 54 years	7.9	8.0	8.5	8.3	7.9	7.8	7.7	7.2	6.9	6.8	6.5	6.4	6.3	6.3	6.0
55 years and over	5.0	5.3	5.3	5.5	5.3	5.1	5.2	5.0	4.9	4.9	4.7	4.3	4.3	4.2	4.4
Men, 16 years and over	9.9	9.9	10.5	10.1	9.9	9.8	9.6	9.1	8.6	8.3	8.1	7.8	7.7	7.7	7.3
16 to 24 years	19.1	18.4	19.5	18.6	18.4	18.6	17.6	17.3	15.9	15.6	15.6	14.6	14.6	15.0	14.0
16 to 19 years	24.4	23.3	23.9	24.0	23.8	24.3	22.8	22.5	20.2	20.4	20.8	19.7	20.0	19.7	19.4
16 to 17 years	26.4	25.2	26.7	26.0	27.3	26.0	23.9	24.3	22.0	23.3	21.6	21.6	23.0	23.7	21.3
18 to 19 years	23.1	22.2	22.3	22.8	21.2	23.2	22.2	21.6	19.6	18.9	19.6	18.1	18.2	17.3	18.3
20 to 24 years	16.4	15.9	17.3	15.9	15.8	15.7	15.0	14.7	13.8	13.3	13.1	12.1	11.9	12.7	11.5
25 years and over	7.5	7.8	8.2	7.9	7.6	7.5	7.5	7.0	6.8	6.5	6.2	6.1	5.9	5.9	5.7
25 to 54 years	8.0	8.2	8.8	8.4	8.1	8.0	8.0	7.4	7.1	6.7	6.6	6.4	6.1	6.2	5.9
55 years and over	5.1	5.6	5.8	5.5	5.5	5.4	5.6	5.4	5.4	5.4	4.8	4.5	4.6	4.4	4.5
Women, 16 years and over	9.4	9.2	9.5	9.8	9.0	9.1	8.8	8.5	8.2	8.1	7.9	7.8	7.9	7.9	7.7
16 to 24 years	16.2	15.8	16.3	16.4	15.0	15.7	15.2	15.1	14.7	14.0	13.9	13.7	14.2	14.1	14.0
16 to 19 years	21.9	21.3	22.0	23.1	21.5	21.1	20.6	20.5	20.1	19.8	18.0	18.9	19.8	19.0	18.6
16 to 17 years	23.2	23.7	24.4	25.2	22.6	23.4	24.0	23.6	21.8	22.5	22.2	22.6	23.1	20.8	19.0
18 to 19 years	21.0	19.9	20.2	21.7	20.5	19.9	18.5	18.8	19.0	18.7	15.4	16.9	18.1	17.8	18.1
20 to 24 years	13.2	12.9	13.4	12.9	11.7	12.8	12.5	12.3	12.0	11.0	11.7	11.0	11.3	11.6	11.6
25 years and over	7.3	7.2	7.5	7.8	7.1	7.0	6.9	6.5	6.2	6.3	6.2	6.1	6.0	6.0	5.8
25 to 54 years	7.7	7.7	8.1	8.1	7.6	7.5	7.3	7.0	6.6	6.8	6.5	6.5	6.5	6.4	6.1
55 years and over	4.8	4.7	4.7	5.5	5.1	4.7	4.5	4.4	4.1	4.3	4.5	4.0	3.9	3.9	4.3

## 7. Unemployed persons by reason for unemployment, seasonally adjusted

[Numbers in thousands]

Reason for unemployment	Annual average		1983								1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Job losers	6,258	6,258	6,753	6,525	6,235	6,133	5,938	5,601	5,226	5,017	4,825	4,737	4,614	4,527	4,327
On layoff	2,127	1,780	1,958	1,841	1,735	1,660	1,562	1,392	1,321	1,283	1,238	1,272	1,254	1,108	1,192
Other job losers	4,141	4,478	4,795	4,684	4,500	4,473	4,376	4,209	3,905	3,734	3,588	3,465	3,360	3,419	3,134
Job leavers	840	830	808	799	752	799	858	866	868	855	809	772	756	781	804
Reentrants	2,384	2,412	2,404	2,436	2,415	2,479	2,362	2,322	2,250	2,246	2,192	2,153	2,208	2,308	2,178
New entrants	1,185	1,216	1,246	1,412	1,229	1,214	1,234	1,127	1,154	1,150	1,175	1,092	1,213	1,216	1,186
<b>PERCENT DISTRIBUTION</b>															
Total unemployed	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	100.0
Job losers	58.7	58.4	60.2	58.4	58.6	57.7	57.1	56.5	55.0	54.1	53.6	54.1	52.5	51.3	50.9
On layoff	19.9	16.6	17.5	16.5	16.3	15.6	15.0	14.0	13.9	13.8	13.7	14.5	14.3	12.5	14.0
Other job losers	38.8	41.8	42.8	41.9	42.3	42.1	42.1	42.4	41.1	40.3	39.9	39.6	38.2	38.7	36.9
Job leavers	7.9	7.7	7.2	7.2	7.1	7.5	8.3	8.7	9.1	9.2	9.0	8.8	8.6	8.8	9.5
Reentrants	22.3	22.5	21.4	21.8	22.7	23.3	22.7	23.4	23.7	24.2	24.4	24.6	25.1	26.1	25.6
New entrants	11.1	11.3	11.1	12.6	11.6	11.4	11.9	11.4	12.1	12.4	13.1	12.5	13.8	13.8	14.0
<b>PERCENT OF CIVILIAN LABOR FORCE</b>															
Job losers	5.7	5.6	6.1	5.8	5.6	5.5	5.3	5.0	4.7	4.5	4.3	4.2	4.1	4.0	3.8
On layoff	.8	.7	.7	.7	.7	.7	.8	.8	.8	.8	.7	.7	.7	.7	.7
Other job losers	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	1.9
Job leavers	1.1	1.1	1.1	1.3	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0

## 8. Duration of unemployment, seasonally adjusted

[Numbers in thousands]

Weeks of unemployment	Annual average		1983								1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Less than 5 weeks	3,883	3,570	3,568	3,630	3,529	3,633	3,740	3,504	3,328	3,382	3,233	3,359	3,386	3,438	3,238
5 to 14 weeks	3,311	2,937	3,012	2,950	2,841	2,951	2,784	2,725	2,616	2,504	2,556	2,484	2,539	2,493	2,433
15 weeks and over	3,485	4,210	4,510	4,486	4,398	4,078	3,889	3,655	3,527	3,369	3,201	2,984	2,873	2,855	2,851
15 to 26 weeks	1,708	1,652	1,774	1,593	1,794	1,597	1,383	1,372	1,337	1,284	1,166	1,173	1,114	1,111	1,186
27 weeks and over	1,776	2,559	2,736	2,893	2,604	2,481	2,506	2,283	2,190	2,085	2,035	1,810	1,759	1,744	1,664
Mean duration in weeks	15.6	20.0	20.2	21.4	21.3	19.9	20.2	20.1	20.2	19.6	20.5	18.8	18.8	18.5	18.4
Median duration in weeks	8.7	10.1	11.9	10.8	10.1	9.4	9.4	9.5	9.4	9.0	9.2	8.3	8.3	8.1	8.7

## EMPLOYMENT, HOURS, AND EARNINGS DATA FROM ESTABLISHMENT SURVEYS

EMPLOYMENT, HOURS, AND EARNINGS DATA in this section are compiled from payroll records reported monthly on a voluntary basis to the Bureau of Labor Statistics and its cooperating State agencies by 195,000 establishments representing all industries except agriculture. In most industries, the sampling probabilities are based on the size of the establishment; most large establishments are therefore in the sample. (An establishment is not necessarily a firm; it may be a branch plant, for example, or warehouse.) Self-employed persons and others not on a regular civilian payroll are outside the scope of the survey because they are excluded from establishment records. This largely accounts for the difference in employment figures between the household and establishment surveys.

### Definitions

**Employed persons** are all persons who received pay (including holiday and sick pay) for any part of the payroll period including the 12th of the month. Persons holding more than one job (about 5 percent of all persons in the labor force) are counted in each establishment which reports them.

**Production workers** in manufacturing include blue-collar worker supervisors and all nonsupervisory workers closely associated with production operations. Those workers mentioned in tables 12-16 include production workers in manufacturing and mining; construction workers in construction; and nonsupervisory workers in transportation and public utilities; in wholesale and retail trade; in finance, insurance, and real estate; and in services industries. These groups account for about four-fifths of the total employment on private nonagricultural payrolls.

**Earnings** are the payments production or nonsupervisory workers receive during the survey period, including premium pay for overtime or late-shift work but excluding irregular bonuses and other special payments. **Real earnings** are earnings adjusted to reflect the effects of changes in consumer prices. The deflator for this series is derived from the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W). The **Hourly Earnings Index** is calculated from average hourly earnings data adjusted to exclude the effects of two types of changes that are unrelated to underlying wage-rate developments: fluctuations in overtime premiums

in manufacturing (the only sector for which overtime data are available) and the effects of changes and seasonal factors in the proportion of workers in high-wage and low-wage industries.

**Hours** represent the average weekly hours of production or nonsupervisory workers for which pay was received and are different from standard or scheduled hours. **Overtime hours** represent the portion of gross average weekly hours which were in excess of regular hours and for which overtime premiums were paid.

**The Diffusion Index**, introduced in table 17 of the May 1983 issue, represents the percent of 185 nonagricultural industries in which employment was rising over the indicated period. One-half of the industries with unchanged employment are counted as rising. In line with Bureau practice, data for the 3-, 6-, and 9-month spans are seasonally adjusted, while that for the 12-month span is unadjusted. The diffusion index is useful for measuring the dispersion of economic gains or losses and is also an economic indicator.

### Notes on the data

Establishment data collected by the Bureau of Labor Statistics are periodically adjusted to comprehensive counts of employment (called "benchmarks"). The latest complete adjustment was made with the release of May 1984 data, published in the July 1984 issue of the *Review*. Consequently, data published in the *Review* prior to that issue are not necessarily comparable to current data. Unadjusted data have been revised back to April 1982; seasonally adjusted data have been revised back to January 1979. Unadjusted data from April 1983 forward, and seasonally adjusted data from January 1980 forward are subject to revision in future benchmarks. Earlier comparable unadjusted and seasonally adjusted data are published in a *Supplement to Employment and Earnings* (unadjusted data from April 1977 through February 1984 and seasonally adjusted data from January 1974 through February 1984) and in *Employment and Earnings, United States, 1909-78*, BLS Bulletin 1312-11 (for prior periods).

A comprehensive discussion of the differences between household and establishment data on employment appears in Gloria P. Green, "Comparing employment estimates from household and payroll surveys," *Monthly Labor Review*, December 1969, pp. 9-20. See also *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, 1982).

## 9. Employment, by industry, selected years, 1950-83

[Nonagricultural payroll data, in thousands]

Year	Total	Private sector	Goods-producing				Service-producing						Government			
			Total	Mining	Construction	Manufacturing	Total	Transportation and public utilities	Wholesale trade	Retail trade	Finance, insurance, and real estate	Services	Total	Federal	State	Local
1950	45,197	39,170	18,506	901	2,364	15,241	26,691	4,034	2,635	6,751	1,888	5,357	6,026	1,928	(1)	(1)
1955	50,641	43,727	20,513	792	2,839	16,882	30,128	4,141	2,926	7,610	2,298	6,240	6,914	2,187	1,168	3,558
1960 <sup>2</sup>	54,189	45,836	20,434	712	2,926	16,796	33,755	4,004	3,143	8,248	2,629	7,378	8,353	2,270	1,536	4,547
1964	58,283	48,686	21,005	634	3,097	17,274	37,278	3,951	3,337	8,823	2,911	8,660	9,596	2,348	1,856	5,392
1965	60,765	50,689	21,926	632	3,232	18,062	38,839	4,036	3,466	9,250	2,977	9,036	10,074	2,378	1,996	5,700
1966	63,901	53,116	23,158	627	3,317	19,214	40,743	4,158	3,597	9,648	3,058	9,498	10,784	2,564	2,141	6,080
1967	65,803	54,413	23,308	613	3,248	19,447	42,495	4,268	3,689	9,917	3,185	10,045	11,391	2,719	2,302	6,371
1968	67,897	56,058	23,737	606	3,350	19,781	44,160	4,318	3,779	10,320	3,337	10,567	11,839	2,737	2,442	6,660
1969	70,384	58,189	24,361	619	3,575	20,167	46,023	4,442	3,907	10,798	3,512	11,169	12,195	2,758	2,533	6,904
1970	70,880	58,325	23,578	623	3,588	19,367	47,302	4,515	3,993	11,047	3,645	11,548	12,554	2,731	2,664	7,158
1971	71,214	58,331	22,935	609	3,704	18,623	48,278	4,476	4,001	11,351	3,772	11,797	12,881	2,696	2,747	7,437
1972	73,675	60,341	23,668	628	3,889	19,151	50,007	4,541	4,113	11,836	3,908	12,276	13,334	2,684	2,859	7,790
1973	76,790	63,058	24,893	642	4,097	20,154	51,897	4,656	4,277	12,329	4,046	12,857	13,732	2,663	2,923	8,146
1974	78,265	64,095	24,794	697	4,020	20,077	53,471	4,725	4,433	12,554	4,148	13,441	14,170	2,724	3,039	8,407
1975	76,945	62,259	22,600	752	3,525	18,323	54,345	4,542	4,415	12,645	4,165	13,892	14,686	2,748	3,179	8,758
1976	79,382	64,511	23,352	779	3,576	18,997	56,030	4,582	4,546	13,209	4,271	14,551	14,871	2,733	3,273	8,865
1977	82,471	67,344	24,346	813	3,851	19,682	58,125	4,713	4,708	13,808	4,467	15,303	15,127	2,727	3,377	9,023
1978	86,697	71,026	25,585	851	4,229	20,505	61,113	4,923	4,969	14,573	4,724	16,252	15,672	2,753	3,474	9,446
1979	89,823	73,876	26,461	958	4,463	21,040	63,363	5,136	5,204	14,989	4,975	17,112	15,947	2,773	3,541	9,633
1980	90,406	74,166	25,658	1,027	4,346	20,285	64,748	5,146	5,275	15,035	5,160	17,890	16,241	2,866	3,610	9,765
1981	91,156	75,126	25,497	1,139	4,188	20,170	65,659	5,165	5,358	15,189	5,298	18,619	16,031	2,772	3,640	9,619
1982 <sup>r</sup>	89,566	73,729	23,813	1,128	3,905	18,781	65,753	5,082	5,278	15,179	5,341	19,036	15,837	2,739	3,640	9,458
1983 <sup>r</sup>	90,138	74,288	23,394	957	3,940	18,497	66,744	4,958	5,259	15,545	5,467	19,665	15,851	2,752	3,660	9,439

<sup>1</sup> Not available.

<sup>2</sup> Data include Alaska and Hawaii beginning in 1959.

r = revised.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

## 10. Employment, by State

[Nonagricultural payroll data, in thousands]

State	Apr. 1983	Mar. 1984	Apr. 1984 <sup>p</sup>	State	Apr. 1983	Mar. 1984	Apr. 1984 <sup>p</sup>
Alabama	1,312.4	1,333.0	1,346.2	Montana	267.6	268.6	270.9
Alaska	205.9	206.4	212.4	Nebraska	602.2	612.5	617.2
Arizona	1,061.8	1,135.1	1,138.2	Nevada	397.9	416.4	411.9
Arkansas	734.8	765.0	770.2	New Hampshire	397.1	415.7	417.3
California	9,833.4	10,185.0	10,241.4	New Jersey	3,106.0	3,191.8	3,226.5
Colorado	1,307.3	1,347.7	1,353.2	New Mexico	472.5	489.5	493.0
Connecticut	1,432.2	1,457.8	1,474.6	New York	7,230.8	7,351.3	7,417.3
Delaware	262.8	267.3	271.7	North Carolina	2,378.4	2,465.0	2,474.9
District of Columbia	595.8	592.7	596.2	North Dakota	245.4	245.5	248.7
Florida	3,874.8	4,117.3	4,130.8	Ohio	4,041.8	4,120.3	4,166.6
Georgia	2,253.3	2,343.7	2,378.4	Oklahoma	1,165.6	1,176.3	1,177.0
Hawaii	403.6	406.9	405.4	Oregon	952.6	979.9	984.2
Idaho	312.8	320.1	323.0	Pennsylvania	4,491.7	4,535.9	4,588.8
Illinois	4,473.1	4,501.8	4,529.9	Rhode Island	390.5	399.1	401.8
Indiana	1,994.1	2,021.8	2,045.9	South Carolina	1,177.2	1,214.1	1,226.8
Iowa	1,019.3	1,025.7	1,033.6	South Dakota	228.8	232.4	235.2
Kansas	916.2	929.7	936.4	Tennessee	1,705.3	1,769.5	1,792.4
Kentucky	1,150.8	1,166.4	1,176.0	Texas	6,143.9	6,286.2	6,313.3
Louisiana	1,555.9	1,566.6	1,569.6	Utah	555.5	585.3	589.5
Maine	410.6	414.0	421.7	Vermont	201.6	206.1	205.3
Maryland	1,693.7	1,717.2	1,734.9	Virginia	2,168.0	2,240.3	2,264.8
Massachusetts	2,655.9	2,697.6	2,729.3	Washington	1,568.8	1,605.9	1,617.3
Michigan	3,145.4	3,255.3	3,261.1	West Virginia	573.4	585.0	588.5
Minnesota	1,688.8	1,742.1	1,779.2	Wisconsin	1,820.8	1,858.1	1,878.2
Mississippi	784.4	799.4	805.4	Wyoming	199.8	198.5	199.2
Missouri	1,909.6	1,926.9	1,948.1	Virgin Islands	36.2	35.9	35.4

p = preliminary.





## 12. Average hours and earnings, by industry 1968-83

[Production or nonsupervisory workers on nonagricultural payrolls]

Year	Private sector			Mining			Construction			Manufacturing					
	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings			
1968	37.8	\$2.85	\$107.73	42.6	\$3.35	\$142.71	37.3	\$4.41	\$164.49	40.7	\$3.01	\$122.51			
1969	37.7	3.04	114.61	43.0	3.60	154.80	37.9	4.79	181.54	40.6	3.19	129.51			
1970	37.1	3.23	119.83	42.7	3.85	164.40	37.3	5.24	195.45	39.8	3.35	133.33			
1971	36.9	3.45	127.31	42.4	4.06	172.14	37.2	5.69	211.67	39.9	3.57	142.44			
1972	37.0	3.70	136.90	42.6	4.44	189.14	36.5	6.06	221.19	40.5	3.82	154.71			
1973	36.9	3.94	145.39	42.4	4.75	201.40	36.8	6.41	235.89	40.7	4.09	166.46			
1974	36.5	4.24	154.76	41.9	5.23	219.14	36.6	6.81	249.25	40.0	4.42	176.80			
1975	36.1	4.53	163.53	41.9	5.95	249.31	36.4	7.31	266.08	39.5	4.83	190.79			
1976	36.1	4.86	175.45	42.4	6.46	273.90	36.8	7.71	283.73	40.1	5.22	209.32			
1977	36.0	5.25	189.00	43.4	6.94	301.20	36.5	8.10	295.65	40.3	5.68	228.90			
1978	35.8	5.69	203.70	43.4	7.67	332.88	36.8	8.66	318.69	40.4	6.17	249.27			
1979	35.7	6.16	219.91	43.0	8.49	365.07	37.0	9.27	342.99	40.2	6.70	269.34			
1980	35.3	6.66	235.10	43.3	9.17	397.06	37.0	9.94	367.78	39.7	7.27	288.62			
1981	35.2	7.25	255.20	43.7	10.04	438.75	36.9	10.82	399.26	39.8	7.99	318.00			
1982 <sup>r</sup>	34.8	7.68	267.26	42.7	10.77	459.88	36.7	11.63	426.82	38.9	8.49	330.26			
1983 <sup>r</sup>	35.0	8.02	280.70	42.5	11.27	478.98	37.2	11.92	443.42	40.1	8.83	354.08			
Year	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings	Average weekly hours	Average hourly earnings	Average weekly earnings
	Transportation and public utilities			Wholesale trade			Retail trade			Finance, insurance, and real estate			Services		
1968	40.6	\$3.42	\$138.85	40.1	\$3.05	\$122.31	34.7	\$2.16	\$74.95	37.0	\$2.75	\$101.75	34.7	\$2.42	\$83.97
1969	40.7	3.63	147.74	40.2	3.23	129.85	34.2	2.30	78.66	37.1	2.93	108.70	34.7	2.61	90.57
1970	40.5	3.85	155.93	39.9	3.44	137.26	33.8	2.44	82.47	36.7	3.07	112.67	34.4	2.81	96.66
1971	40.1	4.21	168.82	39.5	3.65	129.85	33.7	2.60	87.62	36.6	3.22	117.85	33.9	3.04	103.06
1972	40.4	4.65	187.86	39.4	3.85	144.18	33.4	2.75	91.85	36.6	3.36	122.98	33.9	3.27	110.85
1973	40.5	5.02	203.31	39.3	4.08	151.69	33.1	2.91	96.32	36.6	3.53	129.20	33.8	3.47	117.29
1974	40.2	5.41	217.48	38.8	4.39	160.34	32.7	3.14	102.68	36.5	3.77	137.61	33.6	3.75	126.00
1975	39.7	5.88	233.44	38.7	4.73	183.05	32.4	3.36	108.86	36.5	4.06	148.19	33.5	4.02	134.67
1976	39.8	6.45	256.71	38.7	5.03	194.66	32.1	3.57	114.60	36.4	4.27	155.43	33.3	4.31	143.52
1977	39.9	6.99	278.90	38.8	5.39	209.13	31.6	3.85	121.66	36.4	4.54	165.26	33.0	4.65	153.45
1978	40.0	7.57	302.80	38.8	5.88	228.14	31.0	4.20	130.20	36.4	4.89	178.00	32.8	4.99	163.67
1979	39.9	8.16	325.58	38.8	6.39	247.93	30.6	4.53	138.62	36.2	5.27	190.77	32.7	5.36	175.27
1980	39.6	8.87	351.25	38.5	6.96	267.96	30.2	4.88	147.38	36.2	5.79	209.60	32.6	5.85	190.71
1981	39.4	9.70	382.18	38.5	7.56	291.06	30.1	5.25	158.03	36.3	6.31	229.05	32.6	6.41	208.97
1982 <sup>r</sup>	39.0	10.32	402.48	38.3	8.09	309.85	29.9	5.48	163.85	36.2	6.78	245.44	32.6	6.92	225.59
1983 <sup>r</sup>	39.0	10.80	421.20	38.5	8.54	328.79	29.8	5.74	171.05	36.2	7.29	263.90	32.7	7.30	238.71

r = revised.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a new

benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

**13. Average weekly hours, by industry, seasonally adjusted**

[Production or nonsupervisory workers on private nonagricultural payrolls]

Industry	Annual average		1983								1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>P</sup>	May <sup>P</sup>
<b>PRIVATE SECTOR</b> .....	34.8	35.0	34.9	35.0	35.0	35.0	35.2	35.2	35.2	35.2	35.4	35.3	35.3	35.5	35.3
<b>MANUFACTURING</b> .....	38.9	40.1	39.9	40.1	40.2	40.3	40.7	40.6	40.6	40.6	40.9	40.9	40.7	41.2	40.7
Overtime hours .....	2.3	3.0	2.7	2.9	3.0	3.0	3.2	3.3	3.3	3.4	3.5	3.5	3.5	3.7	3.4
<b>Durable goods</b> .....	39.3	40.7	40.3	40.5	40.8	40.8	41.4	41.2	41.3	41.3	41.6	41.7	41.4	41.8	41.4
Overtime hours .....	2.2	3.0	2.6	2.8	3.0	3.0	3.3	3.4	3.5	3.5	3.7	3.8	3.7	4.0	3.5
Lumber and wood products .....	38.0	40.1	39.8	40.0	40.0	40.2	40.4	40.5	40.0	40.0	40.6	40.4	40.1	40.5	39.6
Furniture and fixtures .....	37.2	39.4	39.2	39.5	39.7	39.7	40.0	39.8	39.8	40.1	40.0	39.9	39.6	39.8	39.6
Stone, clay, and glass products .....	40.1	41.5	41.2	41.5	41.6	41.7	42.0	41.8	41.8	41.9	42.1	42.5	41.9	42.3	42.2
Primary metal industries .....	38.6	40.5	40.2	40.4	40.7	40.9	41.2	41.6	41.7	41.8	41.9	42.0	41.8	42.2	42.4
Blast furnaces and basic steel products .....	37.9	39.5	39.2	39.3	39.9	40.1	40.5	40.8	40.8	41.2	41.0	41.3	41.2	40.9	42.1
Fabricated metal products .....	39.2	40.6	40.3	40.4	40.7	40.8	41.4	41.2	41.4	41.4	41.6	41.8	41.3	41.8	41.4
Machinery, except electrical .....	39.7	40.5	40.0	40.3	40.6	40.6	41.1	41.2	41.3	41.5	41.8	41.9	41.9	42.3	41.8
Electric and electronic equipment .....	39.3	40.5	40.2	40.5	40.7	40.7	41.2	41.1	41.1	41.0	41.2	41.2	41.0	41.3	41.0
Transportation equipment .....	40.5	42.1	41.6	41.8	42.0	41.9	43.3	42.5	42.6	42.4	43.2	43.1	42.9	43.5	42.7
Motor vehicles and equipment .....	40.5	43.3	42.6	43.2	42.9	43.1	45.1	44.1	44.1	43.9	44.8	44.3	44.4	44.8	43.4
Instruments and related products .....	39.8	40.4	40.3	40.1	40.5	40.4	40.8	40.7	40.7	40.8	41.3	41.2	41.1	41.4	40.7
<b>Nondurable goods</b> .....	38.4	39.4	39.4	39.5	39.5	39.6	39.9	39.7	39.8	39.7	39.9	39.9	39.8	40.2	39.7
Overtime hours .....	2.5	3.0	2.9	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.3	3.3	3.3	3.4	3.1
Food and kindred products .....	39.4	39.5	39.4	39.7	39.4	39.6	39.8	39.6	39.6	39.5	39.7	39.7	39.8	40.1	39.6
Textile mill products .....	37.5	40.5	40.5	40.7	40.8	40.9	41.3	40.8	40.6	40.7	40.6	40.8	40.6	41.3	40.1
Apparel and other textile products .....	34.7	36.2	36.1	36.2	35.9	36.3	36.7	36.6	36.7	36.6	36.6	36.9	36.7	37.4	36.5
Paper and allied products .....	41.8	42.6	42.7	42.8	42.9	42.9	43.2	43.2	43.1	43.1	43.2	43.2	43.0	43.1	43.1
Printing and publishing .....	37.1	37.6	37.5	37.5	37.6	37.6	37.8	37.9	37.9	37.7	37.9	37.9	37.9	38.3	38.0
Chemicals and allied products .....	40.9	41.6	41.6	41.8	41.8	41.7	41.7	41.7	41.9	41.9	42.1	42.1	42.0	42.0	41.9
Petroleum and coal products .....	43.9	43.9	43.6	43.6	43.8	43.5	43.2	43.6	43.7	44.6	44.8	44.5	44.7	44.0	44.1
Leather and leather products .....	35.6	36.8	36.8	36.8	37.2	37.1	37.8	37.3	37.2	37.1	37.3	37.2	36.7	37.7	37.1
<b>TRANSPORTATION AND PUBLIC UTILITIES</b> .....	39.0	39.0	38.9	38.9	39.0	39.2	39.3	39.4	39.2	39.4	39.5	39.3	39.2	39.5	39.4
<b>WHOLESALE TRADE</b> .....	38.3	38.5	38.5	38.5	38.4	38.5	38.6	38.6	38.6	38.6	38.6	38.5	38.5	38.7	38.5
<b>RETAIL TRADE</b> .....	29.9	29.8	29.8	29.9	29.8	29.8	29.8	30.0	30.0	30.3	30.1	30.0	30.1	30.1	30.2
<b>SERVICES</b> .....	32.6	32.7	32.7	32.7	32.7	32.6	32.7	32.8	32.7	32.6	32.8	32.7	32.8	32.8	32.7

p = preliminary.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a

new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.



### 14. Average hourly earnings, by industry

[Production or nonsupervisory workers on private nonagricultural payrolls]

Industry	Annual average		1983									1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>P</sup>	May <sup>P</sup>	
<b>PRIVATE SECTOR</b>	\$7.68	\$8.02	\$7.98	\$7.98	\$8.01	\$7.95	\$8.12	\$8.16	\$8.16	\$8.16	\$8.26	\$8.24	\$8.24	\$8.29	\$8.28	
Seasonally adjusted	( <sup>1</sup> )	( <sup>1</sup> )	7.98	8.01	8.04	8.00	8.09	8.13	8.14	8.17	8.21	8.23	8.25	8.31	8.28	
<b>MINING</b>	10.77	11.27	11.17	11.22	11.27	11.25	11.33	11.33	11.40	11.41	11.54	11.49	11.60	11.60	11.63	
<b>CONSTRUCTION</b>	11.63	11.92	11.81	11.77	11.80	11.86	12.04	12.06	11.91	12.02	12.08	11.99	11.97	11.94	11.92	
<b>MANUFACTURING</b>	8.49	8.83	8.77	8.79	8.84	8.78	8.89	8.90	8.97	9.04	9.08	9.06	9.09	9.11	9.12	
<b>Durable goods</b>	9.04	9.38	9.31	9.34	9.38	9.32	9.46	9.47	9.53	9.60	9.64	9.63	9.66	9.67	9.67	
Lumber and wood products	7.43	7.79	7.77	7.84	7.82	7.82	7.87	7.86	7.79	7.80	7.88	7.88	7.87	7.88	7.90	
Furniture and fixtures	6.31	6.62	6.52	6.60	6.65	6.67	6.74	6.71	6.73	6.78	6.76	6.75	6.75	6.78	6.78	
Stone, clay, and glass products	8.87	9.27	9.19	9.27	9.33	9.30	9.42	9.38	9.41	9.41	9.42	9.38	9.40	9.50	9.53	
Primary metal industries	11.33	11.34	11.28	11.24	11.37	11.29	11.34	11.28	11.32	11.35	11.38	11.49	11.44	11.51	11.49	
Blast furnaces and basic steel products	13.35	12.89	12.74	12.69	12.81	12.74	12.79	12.68	12.71	12.71	12.76	13.10	12.97	13.13	13.12	
Fabricated metal products	8.77	9.11	9.06	9.08	9.07	9.09	9.18	9.18	9.24	9.35	9.31	9.31	9.31	9.34	9.32	
Machinery, except electrical	9.26	9.55	9.51	9.55	9.57	9.54	9.63	9.66	9.74	9.85	9.85	9.87	9.90	9.92	9.93	
Electric and electronic equipment	8.21	8.65	8.58	8.61	8.67	8.62	8.73	8.71	8.77	8.84	8.88	8.86	8.88	8.89	8.89	
Transportation equipment	11.11	11.66	11.51	11.62	11.60	11.52	11.80	11.87	12.01	12.04	12.06	12.00	12.12	12.05	12.05	
Motor vehicles and equipment	11.62	12.12	11.97	12.12	12.05	11.92	12.31	12.38	12.49	12.47	12.53	12.41	12.62	12.55	12.52	
Instruments and related products	8.06	8.46	8.39	8.40	8.49	8.45	8.54	8.54	8.56	8.65	8.68	8.66	8.71	8.73	8.70	
Miscellaneous manufacturing	6.42	6.80	6.80	6.79	6.80	6.79	6.83	6.84	6.84	6.95	7.00	6.97	6.97	6.96	7.01	
<b>Nondurable goods</b>	7.74	8.08	8.04	8.05	8.12	8.06	8.11	8.12	8.18	8.24	8.27	8.24	8.27	8.29	8.31	
Food and kindred products	7.92	8.20	8.21	8.20	8.20	8.15	8.17	8.16	8.26	8.36	8.41	8.37	8.39	8.43	8.42	
Tobacco manufactures	9.79	10.35	10.78	10.98	10.90	10.26	9.90	9.65	10.77	10.19	10.77	11.13	11.29	11.41	11.54	
Textile mill products	5.83	6.18	6.14	6.16	6.17	6.19	6.23	6.24	6.26	6.31	6.39	6.40	6.41	6.43	6.41	
Apparel and other textile products	5.20	5.37	5.33	5.37	5.35	5.35	5.39	5.40	5.43	5.44	5.50	5.46	5.48	5.48	5.46	
Paper and allied products	9.32	9.94	9.81	9.92	10.07	10.03	10.11	10.11	10.20	10.24	10.23	10.22	10.25	10.29	10.35	
Printing and publishing	8.74	9.11	9.04	9.05	9.09	9.12	9.23	9.23	9.26	9.29	9.26	9.30	9.29	9.30	9.28	
Chemicals and allied products	9.96	10.59	10.50	10.52	10.59	10.62	10.70	10.79	10.86	10.90	10.91	10.90	10.95	10.97	11.02	
Petroleum and coal products	12.46	13.29	13.18	13.19	13.22	13.17	13.38	13.38	13.45	13.54	13.47	13.43	13.44	13.43	13.33	
Rubber and miscellaneous plastics products	7.64	7.99	7.94	7.93	8.02	8.00	8.05	8.08	8.07	8.16	8.17	8.16	8.20	8.25	8.27	
Leather and leather products	5.33	5.54	5.52	5.50	5.53	5.52	5.57	5.56	5.57	5.61	5.68	5.67	5.68	5.67	5.71	
<b>TRANSPORTATION AND PUBLIC UTILITIES</b>	10.32	10.80	10.73	10.72	10.84	10.69	10.88	10.94	11.01	11.00	11.08	11.01	11.02	11.07	11.09	
<b>WHOLESALE TRADE</b>	8.09	8.54	8.49	8.49	8.56	8.54	8.62	8.69	8.68	8.74	8.82	8.79	8.79	8.89	8.85	
<b>RETAIL TRADE</b>	5.48	5.74	5.72	5.73	5.73	5.73	5.78	5.79	5.82	5.78	5.89	5.89	5.89	5.89	5.87	
<b>FINANCE, INSURANCE, AND REAL ESTATE</b>	6.78	7.29	7.29	7.25	7.29	7.24	7.33	7.45	7.39	7.43	7.55	7.54	7.54	7.63	7.55	
<b>SERVICES</b>	6.92	7.30	7.27	7.24	7.24	7.24	7.37	7.43	7.44	7.47	7.57	7.55	7.54	7.60	7.54	

<sup>1</sup>Not available.

p = preliminary.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

### 15. The Hourly Earnings Index, by industry

[Production or nonsupervisory workers on private nonagricultural payrolls; 1977 = 100]

Industry	Not seasonally adjusted					Seasonally adjusted						
	May 1983	Mar. 1984	Apr. 1984	May 1984 <sup>P</sup>	Percent change from: May 1983 to May 1984	May 1983	Jan. 1984	Feb. 1984	Mar. 1984	Apr. 1984	May 1984 <sup>P</sup>	Percent change from: Apr. 1984 to May 1984
<b>PRIVATE SECTOR (in current dollars)</b>	154.7	158.9	159.8	159.6	3.2	154.7	158.4	158.5	159.1	159.9	159.6	-0.2
Mining	164.7	172.0	172.8	173.6	5.4	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Construction	144.1	145.3	145.4	145.5	1.0	144.8	146.3	146.2	146.3	146.5	146.2	-2
Manufacturing	157.1	161.1	161.6	161.8	2.9	157.3	160.3	160.7	161.2	161.5	161.9	2
Transportation and public utilities	156.6	160.2	160.8	161.1	3.6	156.2	159.9	159.8	160.9	161.3	161.7	3
Wholesale trade	157.3	162.7	164.6	163.9	4.2	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Retail trade	150.2	153.4	154.2	153.9	2.5	149.6	152.7	152.9	153.2	153.7	153.3	-3
Finance, insurance, and real estate	158.7	164.2	165.9	164.4	3.6	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Services	155.4	160.8	162.3	161.5	3.9	155.3	159.8	159.8	160.8	162.3	161.3	-6
<b>PRIVATE SECTOR (in constant dollars)</b>	94.7	95.1	95.4	( <sup>2</sup> )	( <sup>2</sup> )	94.8	94.8	94.8	95.1	95.4	( <sup>2</sup> )	( <sup>2</sup> )

<sup>1</sup>This series is not seasonally adjusted because the seasonal component is small relative to the trend-cycle, irregular components, or both, and consequently cannot be separated with sufficient precision.

<sup>2</sup>Not available.

p = preliminary.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

**16. Average weekly earnings, by industry**

[Production or nonsupervisory workers on private nonagricultural payrolls]

Industry	Annual average		1983									1984				
	1982	1983	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>P</sup>	May <sup>P</sup>	
<b>PRIVATE SECTOR</b>																
Current dollars	\$267.26	\$280.70	\$278.50	\$280.90	\$282.75	\$280.64	\$286.64	\$288.05	\$286.42	\$289.68	\$289.10	\$288.40	\$288.40	\$292.64	\$292.28	
Seasonally adjusted	( <sup>1</sup> )	( <sup>1</sup> )	278.50	280.35	281.40	280.00	284.77	286.18	286.53	287.58	290.63	290.52	291.23	295.01	292.28	
Constant (1977) dollars	168.09	171.37	170.55	171.59	172.09	170.08	172.99	173.42	172.44	174.40	173.32	172.59	172.59	174.71	( <sup>1</sup> )	
<b>MINING</b>	459.88	478.98	471.37	476.85	474.47	479.25	488.32	489.46	489.06	495.19	499.68	492.92	496.48	497.64	502.42	
<b>CONSTRUCTION</b>	426.82	443.42	442.88	446.08	450.76	450.68	456.32	449.84	432.33	442.34	438.50	443.63	439.30	448.94	452.96	
<b>MANUFACTURING</b>																
Current dollars	330.26	354.08	349.92	354.24	353.60	352.96	362.71	362.23	365.98	372.45	368.65	368.74	369.96	372.60	371.18	
Constant (1977) dollars	207.71	216.17	214.28	216.40	215.22	213.92	218.90	218.08	220.34	224.23	221.01	220.67	221.40	222.45	( <sup>1</sup> )	
<b>Durable goods</b>																
Lumber and wood products	282.34	312.38	312.35	319.87	314.36	319.06	320.31	319.12	309.26	311.22	311.26	313.62	314.01	317.56	316.79	
Furniture and fixtures	234.73	260.83	254.28	263.34	259.35	267.47	270.95	271.08	269.87	277.98	263.64	263.93	267.02	267.30	267.13	
Stone, clay, and glass products	355.69	384.71	380.47	390.27	390.93	391.53	399.41	394.90	395.22	394.28	386.22	389.27	389.16	400.90	405.03	
Primary metal industries	437.34	459.27	451.20	455.22	460.49	458.37	469.48	464.74	470.91	478.97	476.82	482.58	480.48	488.02	484.88	
Blast furnaces and basic steel products	505.97	509.16	495.59	499.99	514.96	507.05	521.83	508.47	513.48	526.19	521.88	539.72	534.36	551.46	548.42	
Fabricated metal products	343.78	369.87	365.12	369.56	364.61	369.96	379.13	379.13	384.38	395.51	385.43	386.37	384.50	387.61	385.85	
Machinery except electrical	367.62	386.78	379.45	384.87	383.76	383.51	395.79	396.06	405.18	418.63	411.73	413.55	415.80	417.63	414.08	
Electric and electronic equipment	322.65	350.33	344.06	349.57	349.40	349.11	358.80	357.98	363.08	369.51	364.97	364.15	364.08	364.49	363.60	
Transportation equipment	449.96	490.89	482.27	491.53	483.72	474.62	505.04	505.66	515.23	521.33	517.37	514.80	521.16	522.97	518.15	
Motor vehicles and equipment	470.61	524.80	518.30	533.28	518.15	503.02	546.56	545.96	550.81	556.16	555.08	544.80	560.33	563.50	553.38	
Instruments and related products	320.79	341.78	338.12	337.68	340.45	340.54	349.29	346.72	350.96	357.25	356.75	356.79	358.85	358.80	354.09	
Miscellaneous manufacturing	246.53	265.88	263.84	263.45	263.16	264.81	269.10	272.23	272.23	278.00	272.30	276.01	276.01	275.62	275.49	
<b>Nondurable goods</b>																
Food and kindred products	297.22	318.35	315.97	319.59	319.93	319.98	325.21	323.99	327.20	330.42	326.67	326.30	327.49	329.94	329.08	
Tobacco manufactures	312.05	323.90	322.65	326.36	323.90	326.00	330.07	324.77	329.57	333.56	331.35	327.27	329.73	332.99	332.59	
Textile mill products	370.06	387.09	403.17	421.63	401.12	385.78	380.16	370.56	431.88	385.18	410.34	405.13	416.60	450.70	462.75	
Apparel and other textile products	218.63	250.29	249.28	253.18	248.03	254.41	258.55	256.46	256.66	258.71	257.52	259.84	258.96	261.06	257.68	
Paper and allied products	180.44	194.39	192.41	196.54	193.14	195.81	198.35	198.72	199.82	199.65	198.55	200.38	201.12	201.66	199.29	
Printing and publishing	389.58	423.44	416.93	425.57	429.99	429.28	439.79	437.76	440.64	448.51	440.91	438.44	437.68	441.44	444.02	
Chemicals and allied products	324.25	342.54	337.19	338.47	340.88	343.82	350.74	350.74	352.81	356.74	347.25	349.68	353.02	354.33	350.78	
Petroleum and coal products	407.36	440.54	435.75	440.79	440.54	439.67	448.33	449.94	457.21	462.16	458.22	457.80	458.81	460.74	461.74	
Rubber and miscellaneous plastics products	546.99	583.43	575.97	580.36	585.65	572.90	592.73	586.04	590.46	603.88	594.03	584.21	585.98	593.61	589.19	
Leather and leather products	302.54	329.19	326.33	327.51	328.02	329.60	337.30	338.55	338.94	345.98	343.14	342.72	341.94	347.33	344.86	
Transportation and public utilities	189.75	203.87	204.79	207.90	206.82	207.00	209.43	206.83	207.76	209.25	208.46	208.66	205.05	210.92	214.13	
<b>TRANSPORTATION AND PUBLIC UTILITIES</b>	402.48	421.20	415.25	419.15	424.93	422.26	428.67	432.13	432.69	436.70	434.34	429.39	429.78	435.05	434.73	
<b>WHOLESALE TRADE</b>	309.85	328.79	326.02	327.71	330.42	329.64	333.59	336.30	335.92	339.99	338.69	335.78	336.66	342.27	340.73	
<b>RETAIL TRADE</b>	163.85	171.05	169.88	172.47	175.34	174.77	172.82	173.12	173.44	178.02	173.17	173.17	174.34	176.11	176.69	
<b>FINANCE, INSURANCE, AND REAL ESTATE</b>	245.44	263.90	264.63	261.73	264.63	261.36	264.61	271.18	266.78	268.97	275.58	274.46	273.70	279.26	273.31	
<b>SERVICES</b>	225.59	238.71	237.00	238.20	239.64	238.92	241.00	242.96	242.54	243.52	246.78	246.13	245.80	248.52	245.80	

<sup>1</sup> Not available.  
p = preliminary.

NOTE: In accordance with usual practice, BLS has revised establishment survey data to reflect a new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

**17. Indexes of diffusion: industries in which employment increased, seasonally adjusted**

[In percent]

Time span	Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Over 1-month span	1982	27.6	47.6	35.7	31.1	41.1	33.5	34.6	32.4	37.3	28.9	32.4	45.7
	1983	54.3	46.5	60.8	68.9	69.5	64.6	74.3	68.6	69.5	75.4	69.7	73.8
	1984	71.1	73.2	67.0	P64.6	P58.4	—	—	—	—	—	—	—
Over 3-month span	1982	25.1	27.8	27.8	27.3	27.6	28.6	23.5	24.1	26.5	25.9	27.8	41.6
	1983	46.8	57.3	64.1	75.1	75.7	77.8	74.1	81.6	80.8	78.9	79.5	77.6
	1984	82.2	80.5	P77.3	P69.2	—	—	—	—	—	—	—	—
Over 6-month span	1982	19.2	22.2	21.9	24.6	20.3	21.4	21.4	18.6	23.2	27.3	29.5	35.4
	1983	50.8	63.0	69.2	75.1	80.0	82.4	84.1	82.4	84.6	85.9	86.8	83.8
	1984	P81.9	P82.4	—	—	—	—	—	—	—	—	—	—
Over 12-month span	1982	21.6	21.4	17.6	18.1	16.2	18.1	21.1	21.1	25.1	31.6	34.1	40.3
	1983	49.5	54.3	61.9	71.1	77.3	79.5	83.8	88.1	86.8	P87.6	P84.3	—

p = preliminary.

NOTE: Figures are the percent of industries with employment rising. (Half of the unchanged components are counted as rising.) Data are centered within the spans. See the "Definitions" in this section.

In accordance with usual practice, BLS has revised establishment survey data to reflect a new benchmark and updated seasonal adjustment factors. Because of these revisions, establishment data in this table may differ from data published earlier.

## UNEMPLOYMENT INSURANCE DATA

NATIONAL UNEMPLOYMENT INSURANCE DATA are compiled monthly by the Employment and Training Administration of the U.S. Department of Labor from monthly reports of unemployment insurance activity prepared by State agencies. Railroad unemployment insurance data are prepared by the U.S. Railroad Retirement Board.

### Definitions

Data for **all programs** represent an unduplicated count of insured unemployment under State programs, Unemployment Compensation for Ex-Servicemen, and Unemployment Compensation for Federal Employees, and the Railroad Insurance Act.

Under both State and Federal unemployment insurance programs for civilian employees, insured workers must report the completion of at least 1 week of unemployment before they are defined as unemployed. Persons not covered by unemployment insurance (about 10 percent of the labor force) and those who have exhausted or not yet earned benefit rights are excluded from the scope of the survey. **Initial claims** are notices filed by

persons in unemployment insurance programs to indicate they are out of work and wish to begin receiving compensation. A claimant who continued to be unemployed a full week is then counted in the insured unemployment figure. The **rate of insured unemployment** expresses the number of insured unemployed as a percent of the average insured employment in a 12-month period.

Average weekly seasonally adjusted insured unemployment data are computed by BLS' Weekly Seasonal Adjustment program. This procedure incorporated the X-11 Variant of the Census Method II Seasonal Adjustment program.

An **application** for benefits is filed by a railroad worker at the beginning of his first period of unemployment in a benefit year; no application is required for subsequent periods in the same year. **Number of payments** are payments made in 14-day registration periods. The **average amount of benefit payment** is an average for all compensable periods, not adjusted for recovery of overpayments or settlement of underpayments. However, **total benefits** paid have been adjusted.

### 18. Unemployment insurance and employment service operations

[All items except average benefits amounts are in thousands]

Item	1983									1984			
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr. <sup>P</sup>
<b>All programs:</b>													
Insured unemployment	4,642	3,947	3,481	3,275	2,917	2,580	2,478	2,620	2,915	3,374	3,174	2,958	2,610
<b>State unemployment insurance program:<sup>1</sup></b>													
Initial claims <sup>2</sup>	1,874	1,666	1,740	1,804	1,668	1,381	1,522	1,757	2,105	2,356	<sup>r</sup> 1,529	1,433	1,465
Insured unemployment (average weekly volume)	3,906	3,361	3,063	3,049	2,766	2,449	2,358	2,508	2,805	3,249	3,056	2,843	2,512
Rate of insured unemployment	4.5	3.9	3.5	3.5	3.2	2.8	2.7	2.9	3.3	3.8	3.6	3.3	2.9
Weeks of unemployment compensated	14,986	13,133	12,819	<sup>r</sup> 10,957	<sup>r</sup> 11,581	9,383	8,417	9,301	10,168	12,232	<sup>r</sup> 11,622	11,339	9,969
Average weekly benefit amount for total unemployment	\$124.85	\$124.49	\$123.44	<sup>r</sup> \$121.53	<sup>r</sup> \$121.14	<sup>r</sup> \$121.32	\$123.00	\$122.19	\$122.61	\$123.60	<sup>r</sup> \$124.30	\$124.67	\$126.15
Total benefits paid	\$1,816,539	\$1,587,888	\$1,537,372	\$1,297,164	\$1,367,186	\$1,104,404	\$1,002,141	\$1,099,862	\$1,203,605	\$1,457,983	\$1,400,458	\$1,369,536	\$1,215,724
<b>State unemployment insurance program:<sup>1</sup></b>													
(Seasonally adjusted data)													
Initial claims <sup>2</sup>	1,952	1,993	1,836	1,723	1,841	1,664	1,656	1,717	1,620	1,606	<sup>r</sup> 1,568	1,554	1,619
Insured unemployment (average weekly volume)	3,774	3,538	3,301	3,303	3,026	3,088	2,617	2,677	2,721	2,486	2,416	2,505	2,609
Rate of insured unemployment	4.3	4.1	3.8	3.8	3.5	3.6	3.1	3.1	3.2	2.9	2.8	2.9	3.0
<b>Unemployment compensation for ex-servicemen:<sup>3</sup></b>													
Initial claims <sup>1</sup>	15	14	16	16	19	17	16	15	14	15	13	13	12
Insured unemployment (average weekly volume)	30	26	25	25	26	27	28	28	27	27	24	22	20
Weeks of unemployment compensated	117	104	107	<sup>r</sup> 95	<sup>r</sup> 110	106	107	116	113	112	96	89	79
Total benefits paid	\$14,776	\$13,111	\$13,588	<sup>r</sup> \$12,134	<sup>r</sup> \$14,082	<sup>r</sup> \$13,531	\$14,074	\$15,121	\$14,815	\$14,532	<sup>r</sup> \$12,540	\$11,813	\$10,486
<b>Unemployment compensation for Federal civilian employees:<sup>4</sup></b>													
Initial claims	10	9	13	12	11	11	15	13	13	16	10	9	13
Insured unemployment (average weekly volume)	26	22	21	23	22	22	25	27	29	32	31	28	23
Weeks of unemployment compensated	109	93	90	<sup>r</sup> 84	<sup>r</sup> 96	83	88	110	119	133	129	122	98
Total benefits paid	\$12,422	\$10,603	\$10,272	<sup>r</sup> \$9,646	<sup>r</sup> \$10,982	<sup>r</sup> \$9,535	\$10,144	\$12,415	\$13,888	\$15,588	<sup>r</sup> \$15,003	\$14,778	\$11,892
<b>Railroad unemployment insurance:</b>													
Applications	9	4	31	55	14	9	7	8	8	10	4	3	2
Insured unemployment (average weekly volume)	79	70	49	49	46	41	48	40	43	51	49	41	27
Number of payments	172	183	123	92	107	103	92	92	95	121	104	99	70
Average amount of benefit payment	\$203.87	\$215.15	\$203.54	\$199.87	\$214.21	\$214.77	\$211.41	\$212.36	\$213.71	\$210.73	\$209.56	\$208.96	\$196.32
Total benefits paid	\$24,783	\$20,622	\$14,984	\$17,551	\$21,789	\$20,239	\$19,531	\$19,536	\$19,870	\$23,866	\$23,228	\$20,112	\$13,356
<b>Employment service:<sup>5</sup></b>													
New applications and renewals			11,987			15,595			4,297				
Nonfarm placements			1,921			3,012			782				

<sup>1</sup> Initial claims and State insured unemployment include data under the program for Puerto Rican sugarcane workers.

<sup>2</sup> Excludes transition claims under State programs.

<sup>3</sup> Excludes data on claims and payments made jointly with other programs.

<sup>4</sup> Excludes data on claims and payments made jointly with State programs.

<sup>5</sup> Cumulative total for fiscal year (October 1–September 30). Data computed quarterly.

NOTE: Data for Puerto Rico and the Virgin Islands included. Dashes indicate data not available.

p = preliminary.

r = revised.



## PRICE DATA

PRICE DATA are gathered by the Bureau of Labor Statistics from retail and primary markets in the United States. Price indexes are given in relation to a base period (1967 = 100, unless otherwise noted).

### Definitions

The Consumer Price Index is a monthly statistical measure of the average change in prices in a fixed market basket of goods and services. Effective with the January 1978 index, the Bureau of Labor Statistics began publishing CPI's for two groups of the population. It introduced a CPI for All Urban Consumers, covering 80 percent of the total noninstitutional population, and revised the CPI for Urban Wage Earners and Clerical Workers, covering about half the new index population. The All Urban Consumers index covers in addition to wage earners and clerical workers, professional, managerial, and technical workers, the self-employed, short-term workers, the unemployed, retirees, and others not in the labor force.

The CPI is based on prices of food, clothing, shelter, fuel, drugs, transportation fares, doctors' and dentists' fees, and other goods and services that people buy for day-to-day living. The quantity and quality of these items is kept essentially unchanged between major revisions so that only price changes will be measured. Data are collected from more than 24,000 retail establishments and 24,000 tenants in 85 urban areas across the country. All taxes directly associated with the purchase and use of items are included in the index. Because the CPI's are based on the expenditures of two population groups in 1972-73, they may not accurately reflect the experience of individual families and single persons with different buying habits.

Though the CPI is often called the "Cost-of-Living Index," it measures only price change, which is just one of several important factors affecting living costs. Area indexes do not measure differences in the level of prices among cities. They only measure the average change in prices for each area since the base period.

**Producer Price Indexes** measure average changes in prices received in primary markets of the United States by producers of commodities in all stages of processing. The sample used for calculating these indexes contains about 2,800 commodities and about 10,000 quotations per month selected to represent the movement of prices of all commodities produced in the manufacturing, agriculture, forestry, fishing, mining, gas and electricity, and public utilities sectors. The universe includes all commodities produced or imported for sale in commercial transactions in primary markets in the United States.

Producer Price Indexes can be organized by stage of processing or by commodity. The stage of processing structure organizes products by degree of fabrication (that is, finished goods, intermediate or semifinished goods, and crude materials). The commodity structure organizes products by similarity of end-use or material composition.

To the extent possible, prices used in calculating Producer Price Indexes apply to the first significant commercial transaction in the United States, from the production or central marketing point. Price data are generally collected monthly, primarily by mail questionnaire. Most prices are obtained directly from producing companies on a voluntary and confidential basis. Prices generally are reported for the Tuesday of the week containing the 13th day of the month.

In calculating Producer Price Indexes, price changes for the various commodities are averaged together with implicit quantity weights representing their importance in the total net selling value of all commodities as of 1972. The detailed data are aggregated to obtain indexes for stage of processing groupings, commodity groupings, durability of product groupings, and a number of special composite groupings.

**Price indexes for the output of selected SIC industries** measure average price changes in commodities produced by particular industries, as defined in the *Standard Industrial Classification Manual 1972* (Washington, U.S. Office of Management and Budget, 1972). These indexes are derived from several price series, combined to match the economic activity of the specified industry and weighted by the value of shipments in the industry. They use data from comprehensive industrial censuses conducted by the U.S. Bureau of the Census and the U.S. Department of Agriculture.

### Notes on the data

Regional CPI's cross classified by population size were introduced in the May 1978 *Review*. These indexes enable users in local areas for which an index is not published to get a better approximation of the CPI for their area by using the appropriate population size class measure for their region. The cross-classified indexes are published bimonthly. (See table 20.)

For details concerning the 1978 revision of the CPI, see *The Consumer Price Index: Concepts and Content Over the Years*, Report 517, revised edition (Bureau of Labor Statistics, May 1978).

As of January 1976, the Producer Price Index incorporated a revised weighting structure reflecting 1972 values of shipments.

Additional data and analyses of price changes are provided in the *CPI Detailed Report* and *Producer Prices and Price Indexes*, both monthly publications of the Bureau.

For a discussion of the general method of computing producer, and industry price indexes, see *BLS Handbook of Methods*, Bulletin 2134-1 (Bureau of Labor Statistics, 1982), chapter 7. For consumer prices, see *BLS Handbook of Methods for Surveys and Studies* (1976), chapter 13. See also John F. Early, "Improving the measurement of producer price change," *Monthly Labor Review*, April 1978. For industry prices, see also Bennett R. Moss, "Industry and Sector Price Indexes," *Monthly Labor Review*, August 1965.

**19. Consumer Price Index for Urban Wage Earners and Clerical Workers, annual averages and changes, 1967-83**

[1967 = 100]

Year	All items		Food and beverages		Housing		Apparel and upkeep		Transportation		Medical care		Entertainment		Other goods and services	
	Index	Percent change	Index	Percent change	Index	Percent change	Index	Percent change	Index	Percent change	Index	Percent change	Index	Percent change	Index	Percent change
1967	100.0	...	100.0	...	100.0	...	100.0	...	100.0	...	100.0	...	100.0	...	100.0	...
1968	104.2	4.2	103.6	3.6	104.0	4.0	105.4	5.4	103.2	3.2	106.1	6.1	105.7	5.7	105.2	5.2
1969	109.8	5.4	108.8	5.0	110.4	6.2	111.5	5.8	107.2	3.9	113.4	6.9	111.0	5.0	110.4	4.9
1970	116.3	5.9	114.7	5.4	118.2	7.1	116.1	4.1	112.7	5.1	120.6	6.3	116.7	5.1	115.8	5.8
1971	121.3	4.3	118.3	3.1	123.4	4.4	119.8	3.3	118.6	5.2	128.4	6.5	122.9	5.3	122.4	4.8
1972	125.3	3.3	123.2	4.1	128.1	3.8	122.3	2.1	119.9	1.1	132.5	3.2	126.5	2.9	127.5	4.2
1973	133.1	6.2	139.5	13.2	133.7	4.4	126.8	3.7	123.8	3.3	137.7	3.9	130.0	2.8	132.5	3.9
1974	147.7	11.0	158.7	13.8	148.8	11.3	136.2	7.4	137.7	11.2	150.5	9.3	139.8	7.5	142.0	7.2
1975	161.2	9.1	172.1	8.4	164.5	10.6	142.3	4.5	150.6	9.4	168.6	12.0	152.2	8.9	153.9	8.4
1976	170.5	5.8	177.4	3.1	174.6	6.1	147.6	3.7	165.5	9.9	184.7	9.5	159.8	5.0	162.7	5.7
1977	181.5	6.5	188.0	8.0	186.5	6.8	154.2	4.5	177.2	7.1	202.4	9.6	167.7	4.9	172.2	5.8
1978	195.3	7.6	206.2	9.7	202.6	8.6	159.5	3.4	185.8	4.9	219.4	8.4	176.2	5.1	183.2	6.4
1979	217.7	11.5	228.7	10.9	227.5	12.3	166.4	4.3	212.8	14.5	240.1	9.4	187.6	6.5	196.3	7.2
1980	247.0	13.5	248.7	8.7	263.2	15.7	177.4	6.6	250.5	17.7	287.2	11.3	203.7	8.5	213.6	8.8
1981	272.3	10.2	267.8	7.7	293.2	11.4	186.6	5.2	281.3	12.3	295.1	10.4	219.0	7.5	233.3	9.2
1982	288.6	6.0	278.5	4.0	314.7	7.3	190.9	2.3	293.1	4.2	326.9	10.8	232.4	6.1	257.0	10.2
1983	297.4	3.0	284.7	2.2	322.0	2.3	195.6	2.5	300.0	2.4	355.1	8.6	242.4	4.3	286.3	11.4

**20. Consumer Price Index for All Urban Consumers and revised CPI for Urban Wage Earners and Clerical Workers, U.S. city average—general summary and groups, subgroups, and selected items**

[1967 = 100 unless otherwise specified]

General summary	All Urban Consumers								Urban Wage Earners and Clerical Workers							
	1983			1984					1983			1984				
	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.		
All items	295.5	303.1	303.5	305.2	306.6	307.3	308.8	294.9	301.4	301.5	302.7	303.3	303.3	304.1		
Food and beverages	284.6	285.3	286.5	291.6	294.2	294.3	294.5	284.9	285.6	286.8	291.9	294.4	294.5	294.7		
Housing	320.3	327.0	327.4	329.2	331.0	331.5	333.2	320.3	324.5	324.2	324.7	324.2	322.9	322.7		
Apparel and upkeep	195.5	200.7	199.3	196.4	196.2	198.8	199.2	194.8	199.7	198.1	195.3	195.4	198.0	198.2		
Transportation	292.3	306.3	306.3	306.0	305.8	306.9	309.6	293.5	308.2	308.2	307.9	307.7	308.9	311.9		
Medical care	353.5	364.9	366.2	369.5	373.2	374.5	375.7	351.2	362.9	364.3	367.5	371.3	372.6	373.9		
Entertainment	244.6	249.5	249.5	249.9	251.5	251.7	253.8	241.1	245.7	245.8	246.2	247.7	248.0	249.8		
Other goods and services	283.2	298.1	298.6	300.5	301.5	302.1	302.8	281.4	295.5	295.9	298.1	299.2	299.7	300.4		
Commodities	269.2	275.2	275.5	276.8	278.3	278.7	280.1	270.9	276.2	276.3	277.3	278.0	278.1	279.2		
Commodities less food and beverages	257.3	266.3	266.0	265.2	266.0	266.6	268.7	260.3	267.5	267.1	266.4	266.2	266.4	267.8		
Nondurables less food and beverages	267.8	274.5	273.5	272.3	274.0	274.2	275.7	269.7	276.6	275.4	274.2	276.0	276.1	277.5		
Durables	248.7	261.0	261.8	261.4	260.9	262.2	265.2	251.2	258.7	258.9	258.4	256.9	257.1	258.5		
Services	341.2	351.0	351.6	353.9	355.3	356.5	358.1	339.5	348.2	348.4	349.8	350.1	349.9	350.1		
Rent, residential	234.5	241.3	242.0	242.9	243.6	244.8	246.4	234.0	240.7	241.3	242.3	242.9	244.1	245.7		
Household services less rent of shelter (12/82 = 100)	102.0	104.2	104.1	105.1	105.7	105.8	106.2	...	...	...	...	...	...	...		
Transportation services	300.8	310.1	310.8	314.1	314.4	315.4	315.8	297.2	306.0	306.9	310.3	310.6	311.6	312.1		
Medical care services	382.8	395.0	396.3	400.2	404.4	405.3	406.3	379.7	392.3	393.8	397.5	401.8	402.7	403.9		
Other services	274.2	286.5	287.2	288.0	289.1	290.4	291.3	272.0	283.6	284.3	285.0	286.1	287.6	288.3		
<b>Special indexes:</b>																
All items less food	294.7	303.9	304.0	304.8	305.9	306.8	308.6	294.4	302.3	302.1	302.3	302.4	302.4	303.3		
All items less homeowners' costs	101.0	103.6	103.7	104.3	104.8	105.1	105.5	...	...	...	...	...	...	...		
All items less mortgage interest costs	...	...	...	...	...	...	...	281.7	288.3	288.5	290.0	290.9	291.3	292.4		
Commodities less food	255.4	264.1	263.8	263.0	263.8	264.4	266.5	258.2	264.9	264.9	264.2	264.1	264.3	265.7		
Nondurables less food	263.0	269.5	268.5	267.4	269.1	269.3	270.7	265.0	271.5	270.4	269.4	271.1	271.3	272.6		
Nondurables less food and apparel	302.1	309.3	308.6	308.6	311.2	310.3	312.1	303.5	310.9	310.1	310.0	312.4	311.6	313.5		
Nondurables	277.3	281.1	281.2	283.2	285.3	285.5	286.3	278.4	282.1	282.2	284.1	286.3	286.4	287.2		
Services less rent of shelter (12/82 = 100)	101.6	104.7	104.8	105.7	106.3	106.5	106.8	...	...	...	...	...	...	...		
Services less medical care	334.5	344.1	344.5	346.6	347.8	349.0	350.6	333.0	341.3	341.3	342.6	342.4	342.1	342.2		
Domestically produced farm foods	269.9	267.7	269.7	277.2	280.7	279.9	279.4	269.0	266.7	268.7	276.0	279.4	278.6	278.1		
Selected beef cuts	279.4	265.3	265.5	274.6	280.8	279.7	280.6	280.7	266.4	266.6	275.8	282.1	281.3	282.3		
Energy	410.0	419.9	418.0	416.7	420.2	418.1	421.3	410.8	420.8	418.7	417.0	420.2	418.2	421.5		
Energy commodities	403.2	414.4	411.8	409.9	414.5	410.7	414.2	404.3	415.8	412.9	410.7	414.7	411.3	414.8		
All items less energy	287.0	294.4	295.0	297.0	298.2	299.2	300.5	285.6	291.8	292.1	293.5	293.8	294.0	294.6		
All items less food and energy	284.0	293.2	293.6	294.6	295.5	296.7	298.3	282.6	290.3	290.3	290.7	290.4	290.7	291.3		
Commodities less food and energy	240.2	248.9	249.0	248.3	248.5	249.9	251.8	241.2	247.8	247.7	247.2	246.6	247.2	248.4		
Services less energy	334.8	344.9	345.5	348.1	349.5	350.7	352.2	332.7	341.6	341.8	343.4	343.6	343.3	343.3		
Purchasing power of the consumer dollar, 1967 = \$1	\$0.338	\$0.330	\$0.329	\$0.328	\$0.326	\$0.325	\$0.324	\$0.339	\$0.332	\$0.332	\$0.330	\$0.330	\$0.330	\$0.329		





**20. Continued—Consumer Price Index—U.S. city average**

[1967 = 100 unless otherwise specified]

General summary	All Urban Consumers								Urban Wage Earners and Clerical Workers							
	1983			1984					1983			1984				
	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.		
Fruits and vegetables—Continued																
Processed vegetables (12/77 = 100)	138.0	141.8	142.8	144.2	144.6	144.9	145.6	136.8	140.7	141.6	143.0	143.3	143.6	144.3		
Frozen vegetables (12/77 = 100)	150.9	151.8	151.5	153.3	154.2	153.5	156.0	152.5	153.4	153.2	154.9	155.8	155.2	157.7		
Cut corn and canned beans except lima (12/77 = 100)	139.6	143.2	145.8	145.9	146.2	148.2	148.5	137.1	140.8	143.2	143.3	143.7	145.5	145.8		
Other canned and dried vegetables (12/77 = 100)	130.6	136.0	136.8	138.7	138.8	138.8	138.9	129.2	134.5	135.3	137.1	137.1	137.1	137.2		
Other foods at home	339.2	343.4	343.6	346.6	348.4	349.7	351.0	340.0	344.2	344.4	347.4	349.1	350.2	351.6		
Sugar and sweets	373.2	376.0	377.7	380.0	381.2	384.8	387.7	373.0	375.7	377.6	379.7	380.7	384.5	387.3		
Candy and chewing gum (12/77 = 100)	150.8	152.0	152.8	154.0	154.5	156.0	158.6	150.8	151.8	152.7	153.9	154.3	155.9	158.4		
Sugar and artificial sweeteners (12/77 = 100)	168.3	170.4	171.1	170.9	171.8	172.5	171.8	169.7	171.7	172.4	172.0	173.0	173.7	173.0		
Other sweets (12/77 = 100)	151.4	151.7	152.3	153.9	154.0	156.5	156.9	149.1	149.5	150.0	151.8	151.7	154.2	154.7		
Fats and oils (12/77 = 100)	258.6	275.4	278.2	279.7	281.1	280.7	282.4	258.4	275.5	278.2	279.5	280.9	280.2	281.9		
Margarine	259.6	268.9	273.7	278.2	280.5	280.1	280.5	258.1	267.1	271.7	276.4	278.8	278.1	278.5		
Nondairy substitutes and peanut butter (12/77 = 100)	151.5	151.8	151.4	152.2	153.9	153.7	154.3	149.9	150.1	149.6	150.4	151.9	151.8	152.2		
Other fats, oils, and salad dressings (12/77 = 100)	129.5	143.8	145.4	145.4	145.5	145.2	146.7	130.1	144.5	146.1	145.9	146.1	145.6	147.1		
Nonalcoholic beverages	431.8	435.2	433.7	439.1	441.8	443.5	443.6	433.5	437.3	435.7	441.1	443.5	444.9	445.2		
Cola drinks, excluding diet cola	313.1	315.7	314.3	319.9	318.3	319.1	320.8	310.4	313.2	311.6	317.2	315.8	316.1	318.0		
Carbonated drinks, including diet cola (12/77 = 100)	146.8	149.4	148.8	149.1	152.6	153.2	151.3	144.5	147.5	146.9	147.0	150.3	150.7	149.0		
Roasted coffee	361.4	355.4	354.2	359.2	364.3	367.6	368.6	356.2	350.2	349.0	353.9	358.9	362.0	363.0		
Freeze dried and instant coffee	349.5	352.4	351.2	353.7	357.2	359.8	362.2	349.0	351.6	350.5	353.1	356.5	359.1	361.6		
Other noncarbonated drinks (12/77 = 100)	140.6	141.8	141.8	143.8	144.5	144.9	144.7	140.9	142.1	142.2	144.2	144.8	145.2	144.9		
Other prepared foods	276.9	277.9	278.2	279.9	281.4	282.1	283.8	278.5	279.4	279.7	281.5	283.0	283.7	285.4		
Canned and packaged soup (12/77 = 100)	140.9	142.0	142.8	142.6	143.2	143.6	144.6	142.7	143.9	144.6	144.4	145.2	145.5	146.5		
Frozen prepared foods (12/77 = 100)	155.0	156.4	155.5	157.2	156.8	156.0	159.3	154.2	155.7	154.5	156.5	156.1	155.1	158.4		
Snacks (12/77 = 100)	159.2	158.6	158.9	159.5	162.8	163.3	163.0	161.2	160.7	161.0	161.6	164.9	165.4	165.2		
Seasonings, olives, pickles, and relish (12/77 = 100)	159.3	160.7	160.6	161.6	162.3	162.9	163.5	158.3	159.9	159.5	160.5	161.4	161.9	162.4		
Other condiments (12/77 = 100)	155.3	155.4	155.5	156.6	156.6	156.6	157.5	157.1	157.2	157.4	158.4	158.4	158.4	159.4		
Miscellaneous prepared foods (12/77 = 100)	151.6	152.8	153.3	154.3	154.6	155.0	155.8	151.8	153.0	153.5	154.5	154.8	155.1	156.0		
Other canned and packaged prepared foods (12/77 = 100)	147.4	147.0	148.0	149.1	149.7	151.6	151.7	148.7	148.2	149.2	150.4	150.9	152.8	153.0		
Food away from home	318.0	324.8	325.5	327.2	328.5	329.8	330.9	321.3	328.0	328.7	330.4	331.7	333.0	334.1		
Lunch (12/77 = 100)	154.4	157.1	157.5	158.0	158.5	159.0	159.6	156.1	158.7	159.0	159.5	160.1	160.6	161.2		
Dinner (12/77 = 100)	152.5	156.2	156.5	157.6	158.1	158.9	159.6	154.2	157.9	158.3	159.3	159.9	160.8	161.3		
Other meals and snacks (12/77 = 100)	157.1	160.8	161.0	162.0	162.9	163.4	163.7	157.7	161.2	161.4	162.5	163.4	163.9	164.2		
<b>Alcoholic beverages</b>	216.1	218.6	218.1	219.0	219.9	220.7	221.3	218.5	221.5	221.2	222.0	223.0	223.8	224.6		
Alcoholic beverages at home (12/77 = 100)	139.7	140.9	140.4	140.8	141.5	142.0	142.3	141.3	143.0	142.6	142.8	143.6	144.1	144.5		
Beer and ale	222.5	225.9	225.5	225.7	227.7	228.7	229.9	221.2	225.2	224.8	224.9	226.8	227.8	228.9		
Whiskey	151.4	152.9	152.4	153.5	153.2	153.6	153.1	151.9	153.4	152.9	153.7	153.5	153.8	153.7		
Wine	236.3	234.8	232.1	233.2	232.4	233.6	233.4	243.9	242.3	239.9	241.0	238.8	241.5	241.7		
Other alcoholic beverages (12/77 = 100)	121.5	121.5	121.4	121.7	122.8	122.8	122.8	121.3	121.5	121.3	121.6	122.6	122.8	122.7		
Alcoholic beverages away from home (12/77 = 100)	146.5	149.9	150.4	151.6	152.0	152.6	153.6	147.7	150.9	151.5	153.0	153.2	153.9	154.8		
<b>HOUSING</b>	320.3	327.0	327.4	329.2	331.0	331.5	333.2	320.3	324.5	324.2	324.7	324.2	322.9	322.7		
<b>Shelter (CPI-U)</b>	341.7	351.1	351.8	353.2	354.0	355.5	357.8									
Renters' costs	101.8	105.0	105.1	105.7	106.0	106.5	107.4									
Rent, residential	234.5	241.3	242.0	242.9	243.6	244.8	246.4									
Other renters' costs	343.7	359.8	356.1	361.7	362.5	364.5	371.2									
Homeowners' costs	101.7	104.3	104.5	104.9	105.1	105.6	106.2									
Owners' equivalent rent	101.7	104.2	104.5	104.8	105.1	105.5	106.2									
Household insurance	102.0	106.1	106.1	106.6	107.1	107.1	106.1									
Maintenance and repairs	343.6	353.4	354.7	356.7	353.5	355.3	356.3									
Maintenance and repair services	382.8	398.5	400.8	402.4	400.9	405.9	408.1									
Maintenance and repair commodities	258.7	262.3	262.6	264.6	260.4	259.3	259.2									
<b>Shelter (CPI-W)</b>								342.4	347.1	346.6	346.1	343.7	342.0	341.3		
Rent, residential								234.0	240.7	241.3	242.3	242.9	244.1	245.7		
Other renters' costs								342.3	357.3	352.9	359.1	360.9	363.0	370.7		
Lodging while out of town								358.2	370.9	363.9	374.0	377.9	381.3	393.8		
Tenants' insurance (12/77 = 100)								153.2	159.4	159.4	160.4	161.1	161.1	159.8		
Homeownership								381.2	384.9	384.1	382.9	379.4	376.6	374.9		
Home purchase								301.0	300.0	298.9	298.0	294.4	292.5	291.7		
Financing, taxes, and insurance								492.2	499.2	497.6	494.8	490.5	484.8	480.8		
Property insurance								422.3	438.0	437.2	438.3	439.3	439.9	440.3		
Property taxes								232.9	239.6	240.7	242.7	243.2	244.1	244.8		
Contracted mortgage interest costs								625.5	632.2	629.4	624.1	617.2	607.9	601.6		
Mortgage interest rates								206.0	208.6	208.7	207.6	207.7	205.4	203.9		
Maintenance and repairs								339.0	349.1	351.0	353.0	351.9	353.8	354.2		
Maintenance and repair services								378.9	393.3	395.6	397.6	396.8	400.3	401.0		









**21. Consumer Price Index for All Urban Consumers: Cross classification of region and population size class by expenditure category and commodity and service group**

[December 1977 = 100]

Category and group	Size class A (1.25 million or more)			Size class B (385,000-1,250 million)			Size class C (75,000-385,000)			Size class D (75,000 or less)		
	1983			1984			1983			1984		
	Dec.	Feb.	Apr.	Dec.	Feb.	Apr.	Dec.	Feb.	Apr.	Dec.	Feb.	Apr.
<b>Northeast</b>												
<b>EXPENDITURE CATEGORY</b>												
All items	157.2	159.5	160.7	163.7	165.9	166.3	168.3	170.5	170.9	162.3	164.9	166.3
Food and beverages	148.8	152.4	152.7	146.7	151.8	151.5	151.9	155.0	155.2	147.6	152.4	152.4
Housing	161.7	164.3	165.3	172.6	176.9	175.7	179.5	183.7	183.0	166.4	170.1	172.9
Apparel and upkeep	122.7	121.1	123.8	129.5	124.0	128.5	133.0	128.7	131.8	134.1	132.6	133.6
Transportation	166.5	168.4	170.1	174.2	172.6	174.1	172.9	173.2	174.3	172.5	172.2	173.4
Medical care	168.3	171.8	173.2	170.7	175.1	177.6	174.2	176.5	176.9	177.5	181.1	182.5
Entertainment	145.9	146.6	148.1	140.3	140.3	143.8	149.0	149.9	152.8	152.3	152.4	152.3
Other goods and services	167.9	169.1	170.6	167.7	168.7	169.1	172.3	173.5	174.5	171.8	173.6	173.9
<b>COMMODITY AND SERVICE GROUP</b>												
Commodities	151.4	153.6	154.1	157.1	159.3	159.9	157.0	159.1	159.2	155.5	158.6	158.2
Commodities less food and beverages	152.9	154.0	154.7	162.0	162.5	163.5	159.2	160.7	160.8	159.0	161.1	160.4
Services	164.4	166.9	168.8	173.6	175.8	176.1	186.3	188.6	189.6	172.7	174.4	178.4
<b>North Central Region</b>												
<b>EXPENDITURE CATEGORY</b>												
All items	167.6	168.7	169.9	163.6	165.2	166.8	161.6	162.5	163.4	162.8	163.7	164.5
Food and beverages	145.2	149.4	149.4	143.8	148.0	148.6	144.7	148.6	148.8	152.9	155.9	156.9
Housing	185.8	186.2	187.7	171.5	173.4	175.2	169.0	169.9	169.1	167.0	167.0	167.3
Apparel and upkeep	120.3	116.7	118.2	131.2	126.6	132.8	132.3	129.0	132.6	127.5	123.0	126.1
Transportation	168.9	168.6	170.5	171.6	170.9	172.9	172.1	171.1	173.8	170.8	170.0	172.2
Medical care	172.4	176.2	177.4	173.9	176.9	177.2	168.0	170.2	172.7	177.6	183.2	182.9
Entertainment	144.2	144.6	145.1	133.6	135.7	140.6	148.4	148.3	151.0	139.1	144.2	141.3
Other goods and services	163.8	165.9	165.9	177.4	177.4	178.6	161.7	163.0	163.6	172.3	175.0	176.1
<b>COMMODITY AND SERVICE GROUP</b>												
Commodities	155.6	156.8	158.1	154.2	155.7	157.3	152.6	153.6	155.1	152.9	153.8	154.8
Commodities less food and beverages	160.9	160.0	162.1	158.7	158.6	160.9	156.3	155.7	157.9	153.0	152.7	153.8
Services	185.2	186.3	187.2	178.6	180.4	182.1	176.2	176.8	176.8	178.3	179.3	179.8
<b>South</b>												
<b>EXPENDITURE CATEGORY</b>												
All items	163.5	165.7	166.3	164.9	166.9	168.2	163.7	165.3	166.9	165.7	166.6	168.1
Food and beverages	151.9	156.3	156.3	149.8	154.8	155.6	148.5	153.2	153.0	152.3	157.5	156.6
Housing	169.3	172.4	172.3	170.9	172.0	173.7	169.4	170.7	173.2	174.6	174.2	176.4
Apparel and upkeep	130.5	129.9	131.3	128.7	129.6	128.1	126.7	124.8	127.5	116.0	110.9	114.7
Transportation	171.5	171.0	172.6	174.4	174.1	176.2	172.5	171.8	174.0	170.2	170.2	172.3
Medical care	173.6	176.2	177.1	174.0	177.0	178.5	182.7	186.7	187.5	189.9	193.3	193.7
Entertainment	142.9	142.9	145.2	154.6	157.7	159.6	150.0	151.4	153.2	147.5	148.5	150.5
Other goods and services	166.6	169.6	170.0	169.1	171.5	172.4	167.5	169.5	170.2	167.3	167.9	169.2
<b>COMMODITY AND SERVICE GROUP</b>												
Commodities	155.9	157.9	158.6	156.9	159.2	160.2	154.8	156.5	157.7	155.6	159.9	152.9
Commodities less food and beverages	157.7	158.1	159.4	160.1	160.7	161.8	157.8	157.7	159.7	157.1	156.1	158.1
Services	174.0	176.5	176.8	176.9	178.4	180.1	177.5	178.4	181.2	180.8	181.2	183.4
<b>West</b>												
<b>EXPENDITURE CATEGORY</b>												
All items	164.0	165.7	167.2	164.0	165.3	166.8	156.3	157.6	159.1	164.0	164.8	166.5
Food and beverages	152.7	155.8	155.3	154.4	158.4	158.6	150.2	153.7	155.0	156.0	160.3	160.3
Housing	169.4	171.7	173.7	167.2	168.4	170.4	153.9	154.6	155.8	164.4	165.2	168.0
Apparel and upkeep	122.7	123.8	124.3	127.9	124.9	126.9	123.4	123.8	123.9	144.4	141.2	142.9
Transportation	174.2	172.9	176.4	175.3	175.0	177.5	171.1	170.5	173.5	171.1	168.6	171.1
Medical care	178.0	181.2	182.6	176.5	178.2	179.8	180.9	184.5	185.9	178.9	183.8	184.6
Entertainment	142.6	144.3	144.1	147.5	148.1	148.9	148.8	151.8	154.4	161.2	161.4	160.6
Other goods and services	168.8	171.1	171.5	170.0	171.3	171.3	166.2	166.8	166.5	174.5	175.3	175.1
<b>COMMODITY AND SERVICE GROUP</b>												
Commodities	153.5	154.1	155.9	156.3	157.3	158.7	154.3	155.3	157.1	154.3	154.6	155.6
Commodities less food and beverages	153.9	152.9	156.1	157.2	156.2	158.4	156.0	155.3	157.4	153.6	151.5	153.2
Services	177.8	180.6	181.9	174.7	176.2	178.0	158.8	160.4	161.7	178.3	179.9	182.3

**22. Consumer Price Index—U.S. city average, and selected areas**

[1967 = 100 unless otherwise specified]

Area <sup>1</sup>	All Urban Consumers							Urban Wage Earners and Clerical Workers						
	1983			1984				1983			1984			
	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Apr.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
U.S. city average <sup>2</sup>	295.5	303.1	303.5	305.2	306.6	307.3	308.8	294.9	301.4	301.5	302.7	303.3	303.3	304.1
Anchorage, Alaska (10/67 = 100)	...	270.4	...	271.5	...	274.4	...	...	264.0	...	264.0	...	265.9	...
Atlanta, Ga.	297.6	...	307.3	...	309.3	...	311.1	300.1	...	309.7	...	309.6	...	309.3
Baltimore, Md.	...	304.7	...	307.6	...	310.4	...	...	302.4	...	303.8	...	307.2	...
Boston, Mass.	...	294.0	...	296.6	...	302.0	...	...	292.5	...	294.4	...	298.2	...
Buffalo, N.Y.	282.5	...	288.2	...	290.5	...	293.0	278.4	...	285.6	...	285.9	...	286.6
Chicago, Ill.—Northwestern Ind.	295.3	303.9	303.9	305.2	305.0	305.4	306.7	293.6	295.7	294.2	298.3	296.9	296.0	296.3
Cincinnati, Ohio—Ky.—Ind.	...	316.8	...	318.4	...	320.0	...	...	316.0	...	313.4	...	313.8	...
Cleveland, Ohio	319.5	...	330.7	...	331.1	...	332.8	315.3	...	314.9	...	318.2	...	320.7
Dallas-Ft. Worth, Tex.	308.6	...	317.6	...	322.7	...	323.9	301.7	...	313.5	...	317.7	...	316.5
Denver-Boulder, Colo.	...	339.8	...	343.0	...	344.7	...	...	338.4	...	336.0	...	341.7	...
Detroit, Mich.	294.9	299.9	300.1	301.3	303.1	304.1	305.6	295.0	301.8	301.3	307.9	304.7	302.9	298.6
Honolulu, Hawaii	272.8	...	278.4	...	280.7	...	283.2	276.9	...	288.2	...	284.3	...	289.0
Houston, Tex.	316.7	...	320.7	...	323.6	...	325.7	317.6	...	317.9	...	323.5	...	324.9
Kansas City, Mo.—Kansas	295.9	...	303.0	...	306.4	...	309.1	293.5	...	300.0	...	296.6	...	299.7
Los Angeles-Long Beach, Anaheim, Calif.	289.5	296.5	297.7	299.1	300.2	300.7	302.8	290.2	297.8	299.9	299.0	299.0	297.9	298.9
Miami, Fla. (11/77 = 100)	...	164.0	...	165.0	...	165.6	...	...	164.9	...	165.9	...	166.3	...
Milwaukee, Wis.	...	312.5	...	314.0	...	316.8	...	...	328.9	...	327.5	...	335.3	...
Minneapolis-St. Paul, Minn.—Wis.	309.4	...	317.5	...	319.6	...	322.0	312.4	...	312.5	...	318.6	...	321.1
New York, N.Y.—Northeastern N.J.	286.5	293.9	294.3	297.3	299.0	299.9	300.9	282.2	287.3	288.2	290.2	290.5	289.9	291.2
Northeast, Pa. (Scranton)	...	288.5	...	291.0	...	293.0	...	...	290.9	...	293.2	...	294.0	...
Philadelphia, Pa.—N.J.	283.5	291.7	291.8	294.4	296.4	296.7	298.2	286.8	294.8	294.3	296.7	298.5	298.8	299.0
Pittsburgh, Pa.	305.2	...	314.3	...	315.5	...	318.6	300.7	...	302.6	...	299.6	...	301.5
Portland, Oreg.—Wash.	...	293.9	...	295.1	...	298.0	...	...	289.6	...	289.5	...	292.2	...
St. Louis, Mo.—Ill.	...	299.6	...	300.9	...	302.7	...	...	299.3	...	296.8	...	297.3	...
San Diego, Calif.	...	342.3	...	346.6	...	349.8	...	...	323.7	...	329.6	...	326.6	...
San Francisco-Oakland, Calif.	299.3	...	307.3	...	311.7	...	315.9	294.7	...	306.1	...	308.7	...	310.8
Seattle-Everett, Wash.	...	309.5	...	311.1	...	310.2	...	...	299.0	...	299.4	...	299.9	...
Washington, D.C.—Md.—Va.	...	298.6	...	303.4	...	305.1	...	...	302.7	...	308.1	...	308.2	...

<sup>1</sup>The areas listed include not only the central city but the entire portion of the Standard Metropolitan Statistical Area, as defined for the 1970 Census of Population, except that the Standard Consolidated Area is

used for New York and Chicago.  
<sup>2</sup>Average of 85 cities.



### 23. Producer Price Indexes, by stage of processing

[1967 = 100]

Commodity grouping	Annual average 1983	1983									1984				
		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. 1	Feb.	Mar.	Apr.	May	
<b>FINISHED GOODS</b>															
Finished goods	285.2	284.2	285.0	285.7	286.1	285.1	287.6	286.8	287.2	<sup>r</sup> 289.5	290.6	291.7	291.4	291.5	
Finished consumer goods	284.6	283.6	284.6	285.2	285.7	285.1	287.0	285.9	286.3	<sup>r</sup> 289.9	290.1	291.4	290.6	290.7	
Finished consumer foods	261.8	262.6	261.2	260.7	260.7	263.0	263.7	261.9	264.3	272.2	274.7	277.0	275.0	272.3	
Crude	<sup>r</sup> 258.7	267.2	251.2	247.1	259.9	267.4	287.3	270.4	266.0	<sup>r</sup> 306.9	315.9	332.5	307.9	279.7	
Processed	<sup>r</sup> 260.0	260.1	260.0	259.8	258.7	260.5	259.5	259.0	262.0	<sup>r</sup> 266.9	268.9	269.8	269.9	269.4	
Nondurable goods less foods	335.3	332.0	335.7	337.7	338.6	338.6	338.1	336.8	335.2	335.0	335.9	337.0	336.7	339.3	
Durable goods	233.1	232.9	233.1	233.4	233.8	229.2	235.3	235.4	235.9	235.9	236.2	236.6	236.7	236.6	
Consumer nondurable goods less food and energy	<sup>r</sup> 231.5	230.3	230.7	232.0	232.7	233.0	233.6	234.1	234.0	<sup>r</sup> 236.0	236.1	237.2	237.6	238.6	
Capital equipment	<sup>r</sup> 287.2	286.5	286.7	287.2	287.7	285.1	289.9	<sup>r</sup> 290.0	290.4	<sup>r</sup> 291.6	292.5	292.7	294.1	294.3	
<b>INTERMEDIATE MATERIALS</b>															
Intermediate materials, supplies, and components	<sup>r</sup> 312.3	309.7	311.3	312.8	314.0	315.5	315.6	315.5	315.7	<sup>r</sup> 316.3	317.4	319.5	320.2	320.8	
Materials and components for manufacturing	<sup>r</sup> 293.4	291.9	292.4	294.1	294.7	296.7	296.4	296.5	297.6	<sup>r</sup> 298.9	299.5	301.7	302.6	303.0	
Materials for food manufacturing	258.4	257.0	257.0	257.4	260.5	269.4	263.5	260.0	262.9	<sup>r</sup> 268.6	267.9	269.2	271.3	275.6	
Materials for nondurable manufacturing	<sup>r</sup> 280.0	277.7	277.7	279.7	281.1	282.7	283.3	284.6	285.7	<sup>r</sup> 286.6	286.9	290.2	291.4	292.5	
Materials for durable manufacturing	<sup>r</sup> 319.4	318.4	319.0	320.9	320.9	323.1	322.3	321.6	322.8	<sup>r</sup> 323.4	323.3	328.3	329.0	326.8	
Components for manufacturing	<sup>r</sup> 280.4	279.4	280.3	281.6	281.5	281.8	282.6	283.0	283.5	<sup>r</sup> 284.5	284.9	285.2	285.9	286.6	
Materials and components for construction	<sup>r</sup> 301.8	301.2	302.4	302.9	303.7	303.1	303.6	303.9	304.9	<sup>r</sup> 305.5	307.5	309.2	310.1	309.6	
Processed fuels and lubricants	<sup>r</sup> 564.8	547.8	562.0	567.9	572.0	573.4	574.2	568.1	561.7	<sup>r</sup> 566.4	561.7	568.4	564.2	569.2	
Manufacturing industries	<sup>r</sup> 479.0	462.9	475.9	480.9	485.1	487.2	490.5	484.9	478.8	<sup>r</sup> 474.2	478.3	484.2	482.7	488.1	
Nonmanufacturing industries	<sup>r</sup> 640.0	622.2	637.5	644.1	648.0	648.8	647.2	640.6	634.0	<sup>r</sup> 628.0	634.5	641.8	635.1	639.5	
Containers	286.6	285.8	285.9	286.1	286.3	287.1	288.1	289.3	289.9	<sup>r</sup> 292.3	293.2	295.5	298.4	301.3	
Supplies	<sup>r</sup> 277.1	275.6	275.6	276.2	277.9	280.2	280.6	281.6	281.6	<sup>r</sup> 282.6	282.2	283.1	284.1	284.2	
Manufacturing industries	269.9	268.9	269.8	270.1	270.5	270.8	271.8	272.2	273.3	<sup>r</sup> 274.5	275.9	276.2	277.7	278.3	
Nonmanufacturing industries	<sup>r</sup> 281.1	279.3	278.8	279.6	282.0	285.3	285.3	286.7	286.1	<sup>r</sup> 287.0	285.7	286.9	287.7	287.6	
Feeds	<sup>r</sup> 225.9	218.1	213.4	216.2	230.7	249.6	246.7	251.0	243.9	<sup>r</sup> 243.7	227.8	232.3	233.5	229.5	
Other supplies	<sup>r</sup> 292.8	292.2	292.5	291.9	293.0	293.4	294.0	294.8	295.5	<sup>r</sup> 296.6	298.0	298.6	299.3	300.0	
<b>CRUDE MATERIALS</b>															
Crude materials for further processing	323.6	325.8	323.3	320.6	327.1	328.5	324.8	324.0	327.5	<sup>r</sup> 333.5	332.8	339.4	340.1	338.5	
Foodstuffs and feedstuffs	<sup>r</sup> 252.2	256.5	252.1	248.4	256.4	257.2	253.7	251.8	256.0	<sup>r</sup> 264.0	260.7	270.7	270.4	267.2	
Nonfood materials	<sup>r</sup> 477.4	475.4	476.8	476.2	479.6	482.5	478.2	479.4	481.6	<sup>r</sup> 483.4	488.2	487.9	490.4	492.2	
Nonfood materials except fuel	<sup>r</sup> 372.2	369.0	370.5	371.6	375.6	378.1	377.1	377.7	379.1	<sup>r</sup> 380.1	385.5	388.1	389.0	389.7	
Manufacturing industries	<sup>r</sup> 381.9	378.3	379.9	381.6	385.7	388.3	387.4	387.9	389.4	<sup>r</sup> 390.4	395.5	399.1	399.8	400.2	
Construction	<sup>r</sup> 270.6	270.3	271.3	270.9	271.0	272.5	270.5	272.1	272.7	<sup>r</sup> 273.7	280.2	276.8	278.2	281.1	
Crude fuel	931.5	935.9	936.7	927.8	926.9	931.0	910.9	915.3	921.1	<sup>r</sup> 926.1	927.4	911.5	922.2	929.2	
Manufacturing industries	<sup>r</sup> 1,094.5	1,100.9	1,102.3	1,090.4	1,088.9	1,093.9	1,067.1	1,071.8	1,079.0	<sup>r</sup> 1,086.5	1,087.5	1,066.1	1,081.1	1,089.3	
Nonmanufacturing industries	<sup>r</sup> 816.3	819.1	819.4	813.0	812.5	816.1	801.1	805.3	810.1	<sup>r</sup> 813.2	814.6	803.2	810.3	816.6	
<b>SPECIAL GROUPINGS</b>															
Finished goods excluding foods	<sup>r</sup> 290.8	289.3	290.8	291.8	292.5	290.3	293.4	293.0	292.6	292.9	293.6	294.3	294.6	295.7	
Finished consumer goods excluding foods	<sup>r</sup> 291.4	289.4	291.6	292.6	293.5	291.4	293.9	293.2	292.5	292.5	293.1	293.9	293.7	295.1	
Finished consumer goods less energy	249.9	249.7	249.4	249.9	250.2	249.7	252.1	251.7	252.6	<sup>r</sup> 256.1	257.1	258.4	257.9	257.3	
Intermediate materials less foods and feeds	<sup>r</sup> 317.1	314.6	316.4	318.0	318.7	319.5	320.0	319.9	320.2	<sup>r</sup> 320.6	322.1	324.2	324.8	325.4	
Intermediate materials less energy	<sup>r</sup> 295.2	293.9	294.4	295.6	296.5	298.1	298.2	298.5	299.4	<sup>r</sup> 300.5	301.2	303.0	304.1	304.4	
Intermediate foods and feeds	<sup>r</sup> 247.9	244.4	242.8	244.0	250.9	263.2	258.2	257.4	256.9	260.7	254.9	257.3	259.1	260.6	
Crude materials less agricultural products	<sup>r</sup> 538.6	536.2	537.5	536.8	540.0	542.9	538.8	540.3	543.2	<sup>r</sup> 546.3	552.1	550.4	553.3	554.0	
Crude materials less energy	246.5	249.0	246.2	243.9	251.2	252.5	249.6	248.3	252.0	<sup>r</sup> 258.3	257.4	265.8	266.0	263.8	

<sup>1</sup>Data for January 1984 have been revised to reflect the availability of late reports and corrections by respondents. All data are subject to revision 4 months after original publication.

r = revised.



## 24. Continued—Producer Price Indexes, by commodity groupings

[1967 = 100 unless otherwise specified]

Code	Commodity group and subgroup	Annual average 1983	1983								1984				
			May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. <sup>1</sup>	Feb.	Mar.	Apr.	May
<b>INDUSTRIAL COMMODITIES—Continued</b>															
09	Pulp, paper, and allied products	'298.1	296.0	297.0	297.8	298.8	299.9	302.2	303.6	304.0	'309.1	310.5	312.7	315.3	317.0
09-1	Pulp, paper, and products, excluding building paper and board	'271.4	268.7	269.2	270.2	271.1	273.1	275.2	277.4	277.4	'280.8	283.3	286.4	290.1	292.7
09-11	Woodpulp	'346.9	343.2	344.9	345.8	346.4	34.4	347.4	356.7	355.5	'366.2	371.5	376.0	392.5	405.1
09-12	Wastepaper	(2)	(2)	(2)	183.3	(2)	194.4	216.2	215.0	211.5	'211.5	229.3	242.9	258.8	259.3
09-13	Paper	'282.0	279.0	279.5	279.2	280.9	286.0	287.2	288.5	289.3	'294.2	296.6	299.2	300.6	301.3
09-14	Paperboard	'250.9	248.7	249.4	249.7	250.1	254.0	257.3	259.4	260.9	262.2	269.3	273.6	275.4	276.9
09-15	Converted paper and paperboard products	'265.3	264.1	264.5	264.1	264.7	265.0	266.5	267.9	268.0	'270.6	271.6	274.1	277.7	280.6
09-2	Building paper and board	250.0	249.3	255.7	256.2	252.1	252.8	254.7	254.7	250.4	'251.9	253.9	258.9	264.1	265.2
10	Metals and metal products	'307.2	306.1	306.3	307.3	308.2	310.7	310.9	310.9	311.9	'312.9	314.6	316.6	317.8	317.1
10-1	Iron and steel	'343.4	340.9	341.3	342.1	343.2	348.1	348.5	349.5	350.9	'353.8	356.3	356.1	356.5	357.1
10-17	Steel mill products	'352.8	349.8	350.1	350.8	351.7	358.1	358.7	359.5	360.0	'362.5	363.5	363.6	364.3	364.9
10-2	Nonferrous metals	'276.1	277.7	275.7	278.4	279.8	282.0	279.3	276.6	278.2	'276.8	279.5	286.1	289.0	283.6
10-3	Metal containers	'335.4	337.1	337.4	336.5	336.6	338.5	338.3	338.2	340.3	'344.1	344.9	345.6	345.5	348.1
10-4	Hardware	'290.7	288.5	291.5	292.1	292.2	292.5	292.7	293.1	293.5	'293.3	292.9	293.2	293.6	294.1
10-5	Plumbing fixtures and brass fittings	'289.3	289.1	290.8	290.4	290.2	292.4	292.7	294.1	294.0	293.9	296.9	299.9	301.4	301.8
10-6	Heating equipment	'243.6	242.7	243.0	244.9	245.1	246.6	245.3	245.5	245.7	247.3	248.4	248.8	250.3	252.5
10-7	Fabricated structural metal products	'303.5	302.1	302.0	302.2	303.0	304.3	304.2	305.3	306.0	306.5	306.9	308.5	309.3	310.6
10-8	Miscellaneous metal products	'283.6	280.8	283.4	283.7	284.0	284.3	289.0	289.5	289.6	'290.3	290.7	291.7	292.7	293.1
11	Machinery and equipment	286.4	286.0	286.2	287.4	287.4	287.9	287.6	288.0	288.8	'289.7	290.4	291.2	292.4	292.8
11-1	Agricultural machinery and equipment	326.3	326.4	326.4	327.1	327.3	328.5	328.6	330.1	330.1	'331.0	331.1	332.7	335.5	337.1
11-2	Construction machinery and equipment	351.9	352.3	352.5	352.8	352.9	353.5	353.6	353.9	353.6	'354.2	355.9	355.8	357.6	357.8
11-3	Metalworking machinery and equipment	'326.5	326.7	327.0	326.6	326.5	326.6	327.0	327.3	328.7	'329.2	330.4	330.2	332.4	332.9
11-4	General purpose machinery and equipment	'308.2	308.4	308.4	308.5	307.9	308.1	307.8	308.6	309.8	'310.7	310.7	311.7	313.1	313.3
11-6	Special industry machinery and equipment	337.1	335.8	336.7	338.0	339.0	339.8	340.6	341.0	342.0	'342.0	343.3	345.0	347.1	348.2
11-7	Electrical machinery and equipment	'240.1	238.5	238.8	241.7	241.7	242.9	242.6	242.8	243.8	'244.7	245.5	246.5	247.3	247.5
11-9	Miscellaneous machinery	'274.1	275.3	275.0	275.2	275.3	274.5	273.3	273.7	273.9	'275.5	275.5	276.0	276.2	277.2
12	Furniture and household durables	'214.0	213.6	214.0	214.8	214.9	215.4	215.3	215.7	215.7	'216.8	216.9	217.4	217.9	218.9
12-1	Household furniture	234.7	234.4	235.0	235.4	236.3	236.6	236.9	237.4	237.2	'237.8	239.2	240.0	240.7	241.5
12-2	Commercial furniture	'286.3	285.9	286.9	287.5	286.5	287.3	287.4	289.9	289.5	'293.4	293.9	296.4	297.5	297.6
12-3	Floor coverings	'185.4	182.1	181.4	186.6	188.9	189.5	189.3	189.4	189.4	'188.2	187.7	187.5	187.4	191.1
12-4	Household appliances	'206.9	207.5	207.5	207.8	207.7	208.0	207.6	208.0	208.5	'209.8	210.6	210.8	210.7	210.9
12-5	Home electronic equipment	'86.1	86.4	86.5	85.9	85.5	85.8	85.8	85.1	84.5	'84.4	84.4	84.3	84.1	84.1
12-6	Other household durable goods	'313.1	312.7	314.3	314.8	313.9	314.5	314.0	315.1	315.2	'318.0	315.2	315.0	317.9	321.0
13	Nonmetallic mineral products	'325.2	324.1	324.5	325.1	326.3	327.2	328.0	328.9	328.9	'330.1	332.3	333.6	335.6	337.3
13-11	Flat glass	'229.7	229.7	229.7	229.8	229.7	229.5	229.6	230.1	229.9	'229.9	229.5	230.0	229.7	229.5
13-2	Concrete ingredients	'313.3	313.7	314.2	314.0	316.4	317.2	316.7	314.8	314.6	'315.6	321.3	325.8	323.8	326.9
13-3	Concrete products	'302.0	301.1	301.6	302.3	302.7	303.5	303.3	304.1	304.2	'304.9	306.4	306.3	308.8	309.6
13-4	Structural clay products, excluding refractories	'277.8	277.6	281.5	282.4	282.4	282.4	283.5	284.1	284.2	'284.3	283.0	283.6	284.3	285.0
13-5	Refractories	'341.3	338.2	336.8	338.2	339.4	340.2	344.7	353.3	353.3	'353.9	357.0	362.1	362.9	362.9
13-6	Asphalt roofing	'384.0	380.0	379.6	385.3	383.4	387.2	387.9	387.8	384.2	'385.0	390.4	383.7	394.2	396.8
13-7	Gypsum products	'286.0	275.7	273.8	276.0	289.3	297.8	312.8	315.1	322.6	'328.6	339.4	339.5	353.1	360.9
13-8	Glass containers	'352.4	351.8	351.8	351.6	351.3	351.1	350.2	350.4	350.4	'350.6	350.9	351.7	358.4	361.2
13-9	Other nonmetallic minerals	'480.2	478.5	479.5	479.7	481.9	482.5	483.2	487.4	486.8	'486.4	486.8	490.3	490.8	495.0
14	Transportation equipment (12/68 = 100)	256.7	255.8	256.1	256.2	256.8	250.4	260.6	260.5	260.7	'261.5	262.3	262.4	262.9	262.7
14-1	Motor vehicles and equipment	256.8	256.2	256.7	256.6	256.8	249.1	260.6	260.5	260.6	'261.1	261.2	261.3	261.8	261.5
14-4	Railroad equipment	'350.2	350.4	350.1	351.3	351.0	350.7	348.6	348.6	350.5	'351.5	359.2	359.7	361.2	361.2
15	Miscellaneous products	'289.6	287.1	288.0	291.5	292.0	291.4	291.7	291.7	292.8	'294.5	295.0	295.0	294.5	294.3
15-1	Toys, sporting goods, small arms, ammunition	225.2	226.0	225.9	224.3	224.5	224.8	225.9	225.2	225.3	'227.4	228.4	228.2	226.6	226.7
15-2	Tobacco products	'365.4	353.8	352.1	373.4	376.7	376.9	376.8	377.0	377.1	'389.4	390.3	390.3	390.4	390.6
15-3	Notions	280.1	280.3	280.3	280.3	279.7	279.7	279.7	279.6	280.1	'281.4	282.2	282.2	283.0	283.9
15-4	Photographic equipment and supplies	'215.7	216.6	216.5	216.5	216.6	216.6	216.8	216.8	216.8	'216.8	218.2	213.3	213.9	213.5
15-5	Mobile homes (12/74 = 100)	'163.4	162.4	163.1	163.5	163.7	164.3	164.8	165.0	165.1	'162.2	162.8	162.7	164.0	163.9
15-9	Other miscellaneous products	'351.8	349.2	353.4	353.7	352.9	349.6	349.2	349.3	353.2	'350.8	350.2	354.0	351.5	350.0

<sup>1</sup>Data for January 1984 have been revised to reflect the availability of late reports and corrections by respondents. All data are subject to revision 4 months after original publication.  
<sup>2</sup>Not available.  
<sup>3</sup>Prices for natural gas are lagged 1 month.

<sup>4</sup>Includes only domestic production.

<sup>5</sup>Most prices for refined petroleum products are lagged 1 month.

<sup>6</sup>Some prices for industrial chemicals are lagged 1 month.

r = revised.



**25. Producer Price Indexes, for special commodity groupings**

[1967 = 100 unless otherwise specified]

Commodity grouping	Annual average 1983	1983								1984				
		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. <sup>1</sup>	Feb.	Mar.	Apr.	May
All commodities—less farm products	306.6	304.8	306.0	307.1	308.0	308.3	309.2	309.1	309.4	310.7	311.8	313.7	314.2	314.9
All foods	257.5	258.2	256.6	256.2	257.1	260.7	260.5	258.0	260.2	268.3	270.3	273.5	271.6	269.8
Processed foods	258.7	259.6	257.9	257.7	257.6	260.9	258.6	258.0	260.4	266.2	267.1	271.9	272.1	272.4
Industrial commodities less fuels	279.3	278.2	278.7	279.8	280.4	280.0	281.8	282.2	282.9	284.3	285.2	286.6	287.5	287.8
Selected textile mill products (Dec. 1975 = 100)	138.2	137.7	137.4	143.0	139.0	139.1	139.4	139.8	140.1	140.0	141.1	141.5	141.3	142.7
Hosiery	144.7	144.5	144.5	144.5	145.6	145.6	145.6	145.6	145.6	145.8	147.2	147.4	147.4	147.4
Underwear and nightwear	223.8	223.5	222.7	223.3	223.5	224.5	224.7	224.6	225.4	228.6	229.8	229.5	229.8	229.9
Chemicals and allied products, including synthetic rubber and fibers and yarns	283.5	281.6	281.5	284.6	285.0	285.6	285.6	286.3	287.4	287.6	286.4	289.9	290.6	290.9
Pharmaceutical preparations	224.8	223.5	223.6	226.3	226.0	227.1	229.4	231.3	231.8	233.9	235.8	238.7	241.6	242.1
Lumber and wood products, excluding millwork	321.2	324.3	338.8	338.1	331.5	316.5	316.7	314.7	321.4	322.6	331.7	334.0	332.8	320.6
Steel mill products, including fabricated wire products	351.2	348.5	348.7	349.3	350.1	355.9	356.4	357.4	357.8	360.1	361.0	361.2	361.8	362.5
Finished steel mill products, excluding fabricated wire products	351.5	348.5	348.8	349.4	350.3	357.1	357.8	358.6	359.2	361.7	363.1	363.2	363.5	364.2
Finished steel mill products, including fabricated wire products	349.9	347.1	347.4	347.9	348.7	354.8	355.4	356.4	356.9	359.2	360.4	360.6	360.9	361.6
Special metals and metal products	292.6	291.7	292.0	292.6	293.5	291.5	296.4	296.3	297.0	297.8	298.8	300.1	301.0	300.6
Fabricated metal products	294.3	292.6	294.0	294.2	294.7	295.5	297.2	297.9	298.4	299.3	299.7	300.9	301.7	302.7
Copper and copper products	196.6	206.7	201.3	201.6	201.2	198.2	190.7	182.6	185.0	182.1	185.2	194.0	199.8	190.4
Machinery and motive products	279.8	279.2	279.4	280.1	280.4	277.7	282.2	282.4	283.0	283.9	284.6	285.1	286.0	286.2
Machinery and equipment, except electrical	313.6	313.8	313.9	314.2	314.2	314.3	314.1	314.6	315.3	316.3	316.8	317.5	318.9	319.6
Agricultural machinery, including tractors	341.5	341.7	341.8	342.7	342.8	344.0	343.6	344.0	346.4	347.1	347.1	349.2	352.9	355.0
Metalworking machinery	357.1	358.0	357.8	357.8	357.5	357.1	357.6	358.2	359.3	359.2	362.6	362.0	363.2	363.4
Total tractors	369.7	370.5	370.6	370.7	370.0	372.5	372.6	373.1	373.8	374.0	374.5	376.1	384.3	384.5
Agricultural machinery and equipment less parts	330.0	330.1	330.2	331.0	331.2	332.6	331.8	332.2	334.2	335.2	335.2	337.2	340.4	342.2
Farm and garden tractors less parts	347.2	348.8	348.8	348.8	347.5	350.6	350.7	350.9	352.0	352.2	352.9	355.2	362.1	362.4
Agricultural machinery, excluding tractors less parts	337.1	336.2	336.4	338.0	339.2	338.9	338.2	338.7	342.2	343.3	342.7	344.6	345.7	349.3
Construction materials	297.7	296.8	298.6	310.6	299.8	299.9	300.4	300.4	301.3	302.3	304.8	306.4	306.8	306.0

<sup>1</sup>Data for January 1984 have been revised to reflect the availability of late reports and corrections by respondents. All data are subject to revision 4 months after original publication.

r = revised.

**26. Producer Price Indexes, by durability of product**

[1967 = 100]

Commodity grouping	Annual average 1983	1983								1984				
		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. <sup>1</sup>	Feb.	Mar.	Apr.	May
Total durable goods	286.7	286.0	286.7	287.4	287.8	286.8	289.2	289.3	290.1	291.0	292.2	293.2	294.0	293.7
Total nondurable goods	315.7	313.5	314.5	315.4	317.8	319.7	319.1	318.1	318.4	321.2	321.7	325.0	324.9	325.6
Total manufactures	295.7	293.7	295.0	296.1	296.9	297.2	298.5	298.4	298.8	300.0	301.0	302.7	303.0	303.7
Durable	287.3	286.7	287.3	288.0	288.3	287.2	289.6	289.8	290.5	291.3	292.4	293.3	294.1	293.9
Nondurable	304.4	301.0	303.1	304.5	305.9	307.8	307.7	307.4	307.5	309.1	310.0	312.5	312.3	314.0
Total raw or slightly processed goods	339.8	340.9	339.0	338.3	343.8	345.9	343.6	340.6	341.8	348.4	348.2	353.7	354.1	351.7
Durable	249.3	246.1	249.4	249.9	256.8	260.7	259.8	258.5	263.3	267.4	275.4	279.2	280.2	277.2
Nondurable	345.4	346.8	344.6	343.7	349.1	351.0	348.6	345.6	346.5	353.3	352.4	358.0	358.4	356.1

<sup>1</sup>Data for January 1984 have been revised to reflect the availability of late reports and corrections by respondents. All data are subject to revision 4 months after original publication.

r = revised.

## 27. Producer Price Indexes for the output of selected SIC industries

[1967 = 100 unless otherwise specified]

1972 SIC code	Industry description	Annual average 1983	1983								1984				
			May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan. <sup>1</sup>	Feb.	Mar.	Apr.	May
<b>MINING</b>															
1011	Iron ores (12/75 = 100)	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1	177.1
1092	Mercury ores (12/75 = 100)	269.7	268.7	254.1	237.5	231.2	243.3	283.3	287.5	277.0	275.8	245.4	250.0	267.9	273.7
1311	Crude petroleum and natural gas	921.4	921.8	924.2	916.6	915.8	920.0	907.2	909.4	909.4	914.3	913.8	903.5	910.1	914.9
1455	Kaolin and ball clay (6/76 = 100)	164.3	164.3	164.3	164.3	1364.3	164.3	171.7	172.9	172.9	172.9	172.9	174.1	174.1	174.1
<b>MANUFACTURING</b>															
2021	Creamery butter	275.8	275.6	275.6	275.6	276.1	278.4	278.1	278.1	269.5	267.3	267.6	268.4	268.4	269.2
2044	Rice milling	193.4	191.3	194.5	193.7	198.1	201.1	196.7	199.6	199.6	199.6	198.1	198.1	198.1	198.1
2067	Chewing gum	326.8	326.1	327.2	327.2	327.3	327.3	327.3	327.5	327.5	328.0	328.1	328.3	328.8	329.0
2074	Cottonseed oil mills	204.1	186.2	179.2	192.4	220.6	262.9	253.5	233.1	223.3	229.2	201.2	212.2	222.4	244.1
2083	Malt	234.1	232.6	232.6	232.6	232.6	232.6	232.6	241.6	241.6	241.6	241.6	241.6	241.6	241.6
2091	Canned and cured seafoods (12/73 = 100)	174.1	175.7	173.4	173.7	169.4	169.8	170.2	169.2	169.7	169.0	168.8	168.5	166.7	169.4
2098	Macaroni and spaghetti	256.8	255.5	255.5	255.5	255.5	255.5	258.6	261.9	261.9	261.9	261.9	261.9	261.9	261.9
2251	Women's hosiery, except socks (12/75 = 100)	122.4	122.7	122.7	122.7	122.9	122.9	122.9	122.9	122.9	123.0	123.2	123.2	123.2	123.3
2261	Finishing plants, cotton (6/76 = 100)	135.7	138.0	132.9	132.8	133.8	133.5	132.8	138.4	139.4	138.5	141.2	145.2	140.0	140.8
2262	Finishing plants, synthetics, silk (6/76 = 100)	126.7	126.9	125.9	125.1	127.2	125.8	127.2	127.4	127.9	128.7	129.7	129.9	129.4	129.3
2284	Thread mills (6/76 = 100)	164.9	165.7	165.7	165.7	165.7	166.1	166.1	166.1	166.1	166.1	166.2	166.2	168.1	172.7
2298	Cordage and twine (12/77 = 100)	139.3	137.6	137.6	137.6	137.6	139.0	139.0	138.9	139.0	139.0	139.3	139.3	139.3	139.4
2361	Children's dresses and blouses (12/77 = 100)	116.6	115.5	117.0	117.0	117.0	117.0	117.0	117.0	117.0	118.2	117.8	117.8	118.5	118.5
2381	Fabric dress and work gloves	293.3	291.7	291.7	296.3	296.3	296.3	296.3	296.3	297.6	299.1	302.3	304.8	304.8	315.6
2394	Canvas and related products (12/77 = 100)	147.0	146.2	146.2	146.2	146.2	146.2	147.8	147.8	147.8	150.6	151.2	151.2	151.3	151.3
2448	Wood pallets and skids (12/75 = 100)	149.2	148.5	149.5	150.9	151.3	151.0	151.5	151.9	153.6	154.0	155.9	157.8	161.6	165.0
2521	Wood office furniture	281.3	282.5	282.5	283.5	283.6	283.6	283.6	283.6	283.6	285.1	290.3	290.3	290.3	290.3
2654	Sanitary food containers	266.1	265.2	265.2	267.1	267.1	267.8	269.0	269.0	269.0	269.1	274.9	280.0	282.2	282.3
2655	Fiber cans, drums, and similar products (12/75 = 100)	186.5	185.6	185.9	187.7	187.7	187.7	187.8	189.5	189.6	189.6	189.7	191.4	193.1	193.1
2911	Petroleum refining (6/76 = 100)	253.8	246.0	254.0	255.4	257.2	256.8	257.1	253.5	249.7	244.4	246.9	250.1	245.5	248.7
2952	Asphalt felts and coating (12/75 = 100)	166.9	165.1	164.9	167.4	166.4	168.0	168.4	168.6	167.0	167.4	169.9	166.9	171.3	172.4
3251	Brick and structural clay tile	332.3	333.8	334.6	336.4	336.4	336.4	338.4	339.7	339.9	340.2	341.0	342.2	343.7	344.9
3253	Ceramic wall and floor tile (12/75 = 100)	146.0	142.4	149.6	149.6	149.6	149.6	149.6	149.6	149.6	149.6	146.8	146.8	146.8	146.8
3255	Clay refractories	355.6	352.2	349.4	352.1	354.4	355.9	364.3	366.6	366.5	367.2	369.7	371.4	373.5	373.5
3259	Structural clay products, n.e.c.	230.2	234.7	234.7	234.8	234.9	234.9	235.1	235.0	235.0	235.0	232.6	232.9	232.8	232.8
3261	Vitreous plumbing fixtures	278.1	276.1	276.9	277.0	277.0	281.3	283.7	284.5	285.4	285.6	287.0	290.1	290.4	290.8
3263	Fine earthenware food utensils	366.5	365.9	366.5	366.5	366.5	366.5	366.5	368.5	368.5	368.5	383.6	381.4	373.3	378.8
3269	Pottery products, n.e.c. (12/75 = 100)	187.1	186.6	186.6	186.6	186.6	186.6	186.6	189.9	189.9	191.9	189.3	189.1	189.1	192.3
3274	Lime (12/75 = 100)	185.7	185.2	186.2	187.1	187.6	186.3	185.9	182.4	182.5	182.8	184.6	184.2	184.2	184.2
3297	Nonclay refractories (12/74 = 100)	205.2	203.6	203.6	203.7	203.8	203.8	203.9	212.8	212.8	213.1	215.4	220.6	220.2	220.2
3482	Small arms ammunition (12/75 = 100)	180.5	181.6	181.6	181.6	181.6	181.6	181.6	181.6	181.6	190.3	196.6	196.6	196.6	196.6
3623	Welding apparatus, electric (12/72 = 100)	243.6	243.1	242.3	243.5	243.5	243.6	243.9	243.9	244.7	246.0	241.7	242.2	243.7	243.7
3648	Lighting equipment, n.e.c. (12/75 = 100)	172.8	172.6	173.1	173.4	173.4	173.5	173.7	173.9	172.6	173.5	173.5	184.8	184.9	185.6
3671	Electron tubes, receiving type	435.4	432.1	432.2	432.5	432.5	432.8	432.9	432.9	469.8	490.6	490.7	490.9	490.8	490.8
3942	Dolls (12/75 = 100)	137.5	137.7	137.7	137.7	137.7	137.7	137.7	137.7	137.7	137.6	137.4	137.4	131.3	133.1
3944	Games, toys, and children's vehicles	238.7	242.2	242.2	236.1	236.2	236.3	236.4	236.2	236.2	239.3	236.5	235.9	235.5	234.6
3955	Carbon paper and inked ribbons (12/75 = 100)	139.2	139.2	139.2	139.2	139.2	139.2	139.3	139.3	139.3	144.3	149.0	149.1	149.1	149.1
3995	Burial caskets (6/76 = 100)	153.5	152.1	152.1	155.4	155.4	155.4	156.0	156.0	156.0	156.0	157.2	157.3	158.8	158.8
3996	Hard surface floor coverings (12/75 = 100)	161.5	159.6	159.6	162.2	163.4	163.5	163.5	163.5	163.5	165.2	165.2	165.2	166.3	166.4

<sup>1</sup>Data for January 1984 have been revised to reflect the availability of late reports and corrections by respondents. All data are subject to revision 4 months after original publication.

r = revised.

## PRODUCTIVITY DATA

PRODUCTIVITY DATA are compiled by the Bureau of Labor Statistics from establishment data and from measures of compensation and output supplied by the U.S. Department of Commerce and the Federal Reserve Board.

### Definitions

**Output** is the constant dollar gross product produced by the particular sector. **Output per hour of all persons** (labor productivity) measures the value of goods and services in constant prices produced per hour of labor. **Output per unit of capital services** (capital productivity) measures the value of goods and services in constant dollars per unit of capital services input.

**Multifactor productivity** measures the output per unit of combined labor and capital input. The traditional measure of output per hour reflects changes in capital per hour and a combination of other factors—such as, changes in technology, shifts in the composition of the labor force, changes in capacity utilization, research and development, skill and efforts of the work force, management, and so forth. The multifactor productivity measure differs from the familiar BLS measure of output per hour of all persons in that it excludes the effects of the substitution of capital for labor.

**Compensation per hour** includes wages and salaries of employees plus employers' contributions for social insurance and private benefit plans. The data also include an estimate of wages, salaries, and supplementary payments for the self-employed, except for nonfinancial corporations, in which there are no self-employed. **Real compensation per hour** is compensation per hour adjusted by the Consumer Price Index for All Urban Consumers.

**Unit labor costs** measure the labor compensation costs required to produce a unit of output and is derived by dividing compensation by output. **Unit nonlabor payments** include profits, depreciation, interest, and indirect taxes per unit of output. They are computed by subtracting compensation of all persons from current dollar gross product and dividing by output. **Unit nonlabor costs** contain all the components of unit nonlabor payments except unit profits. **Unit profits** include corporate profits and the value of inventory adjustments per unit of output.

The **implicit price deflator** is the price index for the gross product of the sector reported. It is derived by dividing the current dollar gross product by the constant dollar figures.

**Hours of all persons** measures the labor input of payroll workers, self-employed persons, and unpaid family workers. **Output per all employee**

**hour** describes labor productivity in nonfinancial corporations where there are no self-employed. The **capital services** input index used in the multifactor productivity computation is developed by BLS from measures of the net stock of physical assets—equipment, structures, land, and inventories—weighted by rental prices for each type of asset. **Combined units of labor and capital input** are computed by combining changes in labor and capital inputs with weights which represent each component's share of total output. The indexes for capital services and combined units of labor and capital are based on changing weights which are averages of the shares in the current and preceding year (the Tornquist index-number formula).

### Notes on the data

In the business sector and the nonfarm business sector, the output measure employed in the computation of output per hour is constructed from Gross Domestic Product rather than Gross National Product. Multifactor productivity measures (table 28) for the *private* business and *private* nonfarm business sectors differ from the business and nonfarm business sector measures used in the traditional labor productivity indexes (tables 29–32) in that they exclude the activities of government enterprises. There is no difference in the sector definition for manufacturing.

Output measures for the business sectors are derived from data supplied by the Bureau of Economic Analysis, U.S. Department of Commerce, and the Federal Reserve Board. Quarterly manufacturing output indexes are adjusted by the Bureau of Labor Statistics to annual estimates of output (gross product originating) from the Bureau of Economic Analysis. Compensation and hours data are from the Bureau of Labor Statistics and the Bureau of Economic Analysis.

The productivity and associated cost measures in the tables describe the relationship between output in real terms and the labor time and capital services involved in its production. They show the changes from period to period in the amount of goods and services produced per unit of input. Although these measures relate output to hours and capital services, they do not measure the contributions of labor, capital, or any other specific factor of production. Rather, they reflect the joint effect of many influences, including changes in technology; capital investment; level of output; utilization of capacity, energy, and materials; the organization of production; managerial skill; and the characteristics and efforts of the work force. For a more complete description of the methodology underlying the multifactor productivity measures, see Bulletin 2178, "Trends in Multifactor Productivity, 1948–81" (September 1983).



## 28. Annual indexes of multifactor productivity and related measures, selected years, 1948-82

[1977 = 100]

Item	1948	1950	1960	1970	1973	1974	1975	1976	1978	1979	1980	1981	1982
<b>PRIVATE BUSINESS SECTOR</b>													
Productivity:													
Output per hour of all persons	45.3	49.7	64.8	86.1	94.7	92.4	94.5	97.6	100.6	99.3	98.8	101.2	101.1
Output per unit of capital services	99.0	98.6	98.5	98.5	103.0	96.5	92.0	96.1	101.8	100.3	95.5	95.8	90.9
Multifactor productivity	60.0	63.6	75.4	90.2	97.5	93.8	93.6	97.1	101.0	99.7	97.7	99.3	97.5
Output	36.8	39.5	53.3	78.3	91.8	89.9	88.0	93.7	105.5	107.9	106.4	109.8	106.6
Inputs:													
Hours of all persons	81.3	79.5	82.2	90.9	96.9	97.2	93.1	95.9	104.9	108.6	107.7	108.4	105.4
Capital services	37.2	40.1	54.1	79.4	89.1	93.1	95.7	97.5	103.6	107.5	111.4	114.6	117.3
Combined units of labor and capital input	61.3	62.1	70.7	86.8	94.1	95.8	94.0	96.5	104.4	108.2	108.9	110.5	109.4
Capital per hour of all persons	45.7	50.4	65.8	87.4	92.0	95.8	102.8	101.6	98.8	99.0	103.4	105.7	111.3
<b>PRIVATE NONFARM BUSINESS SECTOR</b>													
Productivity:													
Output per hour of all persons	51.2	55.6	67.9	86.8	95.3	92.9	94.7	97.8	100.6	99.0	98.3	100.2	100.2
Output per unit of capital services	97.9	98.2	98.4	98.6	103.2	96.5	91.7	96.1	101.9	100.1	95.2	95.0	90.1
Multifactor productivity	64.6	68.1	77.6	90.6	97.9	94.1	93.6	97.2	101.1	99.4	97.3	98.4	96.6
Output	35.6	38.3	52.3	77.8	91.7	89.7	87.6	93.6	105.7	108.0	106.4	109.3	106.2
Inputs:													
Hours of all persons	69.6	69.0	77.0	89.7	96.2	96.6	92.5	95.7	105.1	109.0	108.2	109.0	106.0
Capital services	36.4	39.0	53.2	78.9	88.8	93.0	95.6	97.4	103.7	107.9	111.7	115.1	118.0
Combined units of labor and capital input	55.2	56.3	67.4	85.9	93.6	95.4	93.6	96.3	104.6	108.6	109.4	111.0	110.0
Capital per hour of all persons	52.3	56.6	69.0	88.0	92.3	96.3	103.4	101.8	98.7	99.0	103.2	105.5	111.2
<b>MANUFACTURING</b>													
Productivity:													
Output per hour of all persons	45.1	49.4	60.0	79.1	93.0	90.8	93.4	97.5	100.8	101.5	101.7	105.3	106.5
Output per unit of capital services	93.9	94.5	88.0	91.8	108.2	99.6	89.4	96.1	101.5	99.5	90.7	90.2	82.7
Multifactor productivity	56.1	59.9	67.0	82.3	96.8	93.0	92.2	97.1	101.0	101.0	98.7	101.2	99.9
Output	35.8	38.6	50.7	77.0	95.9	91.9	85.4	93.6	105.3	108.2	103.5	106.5	99.1
Inputs:													
Hours of all persons	79.4	78.2	84.4	97.3	103.2	101.2	91.4	95.9	104.5	106.6	101.8	101.2	93.0
Capital services	38.1	40.9	57.5	83.9	88.6	92.2	95.5	97.4	103.8	108.8	114.1	118.0	119.9
Combined units of labor and capital input	63.8	64.6	75.6	93.6	99.1	98.8	92.6	96.4	104.3	107.2	104.8	105.2	99.2
Capital per hour of all persons	48.0	52.3	68.2	86.2	85.9	91.1	104.4	101.5	99.3	102.1	112.1	116.7	128.8

## 29. Annual indexes of productivity, hourly compensation, unit costs, and prices, selected years, 1950-83

[1977 = 100]

Item	1950	1955	1960	1965	1970	1975	1976	1978	1979	1980	1981	1982	1983
<b>Business sector:</b>													
Output per hour of all persons	50.4	58.3	65.2	78.3	86.2	94.5	97.6	100.6	99.4	98.9	101.3	101.2	103.9
Compensation per hour	20.0	26.4	33.9	41.7	58.2	85.5	92.9	108.6	118.7	131.2	143.9	155.1	163.0
Real compensation per hour	50.5	59.6	69.5	80.1	90.8	96.3	98.9	100.9	99.1	96.5	95.9	97.4	99.2
Unit labor costs	39.8	45.2	52.1	53.3	67.5	90.5	95.1	108.0	119.5	132.7	142.1	153.3	156.9
Unit nonlabor payments	43.4	47.6	50.6	57.6	63.2	90.4	94.0	106.7	112.8	119.0	136.2	136.9	146.1
Implicit price deflator	41.0	46.0	51.6	54.7	66.0	90.4	94.7	107.5	117.2	128.1	140.1	147.7	153.2
<b>Nonfarm business sector:</b>													
Output per hour of all persons	56.3	62.7	68.3	80.5	86.8	94.7	97.8	100.6	99.1	98.4	100.3	100.2	103.4
Compensation per hour	21.8	28.3	35.7	42.8	58.7	86.0	93.0	108.6	118.4	130.7	143.5	154.7	163.4
Real compensation per hour	55.0	64.0	73.0	82.2	91.5	96.8	99.0	100.9	98.9	96.1	95.6	97.1	99.4
Unit labor costs	38.8	45.1	52.3	53.2	67.6	90.8	95.1	108.0	119.5	132.8	143.0	154.4	157.9
Unit nonlabor payments	42.7	47.8	50.4	58.0	63.8	88.5	93.5	105.3	110.4	118.5	135.0	137.0	146.6
Implicit price deflator	40.1	46.0	51.6	54.8	66.3	90.0	94.6	107.1	116.5	128.1	140.4	148.6	154.2
<b>Nonfinancial corporations:</b>													
Output per hour of all persons	(1)	(1)	68.0	81.9	87.4	95.5	98.2	100.9	100.7	99.8	102.3	102.8	106.2
Compensation per hour	(1)	(1)	37.0	43.9	59.4	86.1	92.9	108.5	118.7	130.9	143.6	154.8	162.2
Real compensation per hour	(1)	(1)	75.8	84.3	92.7	96.9	98.9	100.7	99.1	96.3	95.7	97.2	98.7
Unit labor costs	(1)	(1)	54.4	53.5	68.0	90.2	94.6	107.5	117.8	131.2	140.3	150.6	152.8
Unit nonlabor payments	(1)	(1)	54.6	60.8	63.1	90.8	95.0	104.2	106.9	117.4	134.4	137.6	148.8
Implicit price deflator	(1)	(1)	54.5	56.1	66.3	90.4	94.7	106.4	114.1	126.4	138.3	146.1	151.4
<b>Manufacturing:</b>													
Output per hour of all persons	49.4	56.4	60.0	74.5	79.1	93.4	97.5	100.8	101.5	101.7	105.3	106.5	113.1
Compensation per hour	21.5	28.8	36.7	42.8	57.6	85.4	92.3	108.3	118.8	132.7	145.8	158.2	166.7
Real compensation per hour	54.0	65.1	75.1	82.3	89.8	96.2	98.3	100.6	99.2	97.6	97.2	99.3	101.4
Unit labor costs	43.4	51.0	61.1	57.5	72.7	91.5	94.6	107.4	117.0	130.5	138.5	148.5	147.4
Unit nonlabor payments	54.3	58.5	61.1	69.3	65.0	87.3	93.7	102.5	99.9	97.7	110.2	109.2	P126.4
Implicit price deflator	46.6	53.2	61.1	61.0	70.5	90.3	94.4	106.0	112.0	120.9	130.2	137.0	P141.3

<sup>1</sup> Not available.

p = preliminary.

**30. Annual changes in productivity, hourly compensation, unit costs, and prices, 1972-83**

Item	Year											Annual rate of change	
	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1950-83	1972-83
<b>Business sector:</b>													
Output per hour of all persons	2.6	-2.4	2.2	3.3	2.4	0.6	-1.2	-0.5	2.4	-0.1	2.7	2.2	1.1
Compensation per hour	8.0	9.4	9.6	8.6	7.7	8.6	9.4	10.5	9.7	7.7	5.1	6.6	8.6
Real compensation per hour	1.6	-1.4	0.5	2.6	1.2	0.9	-1.7	-2.6	-0.6	1.5	1.9	2.1	0.3
Unit labor costs	5.3	12.1	7.3	5.1	5.1	8.0	10.7	11.1	7.1	7.9	2.4	4.2	7.4
Unit nonlabor payments	5.9	4.4	15.1	4.0	6.4	6.7	5.8	5.5	14.4	0.5	6.7	3.7	6.8
Implicit price deflator	5.5	9.5	9.8	4.7	5.6	7.5	9.0	9.2	9.4	5.4	3.7	4.1	7.2
<b>Nonfarm business sector:</b>													
Output per hour of all persons	2.4	-2.5	2.0	3.2	2.2	0.6	-1.5	-0.7	1.9	-0.1	3.2	1.9	1.0
Compensation per hour	7.6	9.4	9.6	8.1	7.5	8.6	9.0	10.4	9.8	7.8	5.6	6.3	8.6
Real compensation per hour	1.3	-1.4	0.4	2.2	1.0	0.9	-2.0	-2.8	-0.6	1.6	2.3	1.8	0.3
Unit labor costs	5.0	12.2	7.5	4.8	5.2	8.0	10.7	11.1	7.7	7.9	2.3	4.3	7.4
Unit nonlabor payments	1.3	5.9	16.7	5.7	6.9	5.3	4.8	7.4	13.9	1.4	7.0	3.8	6.9
Implicit price deflator	3.8	10.2	10.3	5.1	5.7	7.1	8.8	10.0	9.6	5.8	3.8	4.2	7.3
<b>Nonfinancial corporations:</b>													
Output per hour of all employees	2.4	-3.7	2.9	2.9	1.8	0.9	-0.2	-0.9	2.5	0.5	3.3	(1)	1.1
Compensation per hour	7.5	9.4	9.6	7.9	7.6	8.5	9.4	10.3	9.7	7.8	4.8	(1)	8.4
Real compensation per hour	1.2	-1.5	0.4	2.0	1.1	0.7	-1.7	-2.8	-0.6	1.6	1.5	(1)	0.2
Unit labor costs	4.9	13.6	6.5	4.9	5.7	7.5	9.6	11.3	7.0	7.3	1.4	(1)	7.2
Unit nonlabor payments	1.5	7.1	20.1	4.6	5.3	4.2	2.6	9.8	14.5	2.4	8.1	(1)	7.1
Implicit price deflator	3.8	11.4	10.9	4.8	5.6	6.4	7.2	10.8	9.4	5.7	3.6	(1)	7.2
<b>Manufacturing:</b>													
Output per hour of all persons	5.4	-2.4	2.9	4.4	2.5	0.8	0.7	0.2	3.5	1.2	6.2	2.5	2.3
Compensation per hour	7.2	10.6	11.9	8.0	8.3	8.3	9.7	11.7	9.9	8.5	5.4	6.4	9.2
Real compensation per hour	0.9	-0.3	2.5	2.1	1.8	0.6	-1.4	-1.6	-0.4	2.2	2.1	1.9	0.8
Unit labor costs	1.7	13.3	8.8	3.4	5.7	7.4	9.0	11.5	6.1	7.2	-0.7	3.8	6.6
Unit nonlabor payments	-3.3	-1.8	25.9	7.4	6.7	2.5	-2.6	-2.2	12.8	-0.9	15.7	2.6	5.1
Implicit price deflator	0.3	9.0	13.1	4.6	6.0	6.0	5.7	7.9	7.7	5.2	13.1	3.4	6.2

<sup>1</sup> Not available. r = revised.  
p = preliminary.

**31. Quarterly indexes of productivity, hourly compensation, unit costs, and prices, seasonally adjusted**  
[1977 = 100]

Item	Annual average		Quarterly indexes										
			1981		1982				1983				1984
	1982	1983	III	IV	I	II	III	IV	I	II	III	IV	I
<b>Business sector:</b>													
Output per hour of all persons	101.2	103.9	102.3	101.2	101.1	100.7	101.1	101.9	102.4	103.9	104.2	105.3	106.3
Compensation per hour	155.1	163.0	145.5	148.2	151.6	154.0	156.5	158.6	160.6	162.0	163.5	166.2	168.6
Real compensation per hour	97.4	99.2	95.6	95.8	97.1	97.3	97.2	98.1	99.3	99.1	99.0	99.5	99.8
Unit labor costs	153.3	156.9	142.3	146.4	149.9	152.9	154.7	155.6	156.9	156.0	156.9	157.9	158.6
Unit nonlabor payments	136.9	146.1	139.9	140.2	137.0	137.0	136.3	137.4	140.9	145.7	147.6	149.9	151.9
Implicit price deflator	147.7	153.2	141.5	144.3	145.5	147.5	148.5	149.4	151.5	152.5	153.8	155.2	156.3
<b>Nonfarm business sector:</b>													
Output per hour of all persons	100.2	103.4	101.1	99.9	100.0	99.9	100.5	100.7	101.6	103.4	104.0	104.7	105.6
Compensation per hour	154.7	163.4	145.1	147.7	151.3	153.5	156.1	158.3	160.8	162.6	164.1	165.9	168.3
Real compensation per hour	97.1	99.4	95.3	95.5	96.9	97.0	97.0	97.9	99.4	99.4	99.3	99.3	99.6
Unit labor costs	154.4	157.9	143.5	147.8	151.3	153.6	155.4	157.1	158.3	157.2	157.8	158.4	159.4
Unit nonlabor payments	137.0	146.6	138.3	139.5	136.4	137.7	136.5	137.2	140.7	145.8	148.3	151.3	151.9
Implicit price deflator	148.6	154.2	141.8	145.0	146.4	148.3	149.1	150.5	152.4	153.4	154.7	156.1	156.9
<b>Nonfinancial corporations:</b>													
Output per hour of all employees	102.8	106.2	103.0	102.2	102.4	102.3	103.3	103.4	104.2	105.8	106.9	107.8	108.3
Compensation per hour	154.8	162.2	145.0	147.8	151.7	153.7	156.1	158.1	160.3	161.4	162.6	164.5	166.3
Real compensation per hour	97.2	98.7	95.2	95.5	97.1	97.1	96.9	97.8	99.1	98.7	98.5	98.5	98.4
Total unit costs	153.5	155.2	143.6	147.7	150.9	153.1	153.8	156.3	156.7	155.3	154.5	154.4	154.8
Unit labor costs	150.6	152.8	140.7	144.6	148.1	150.2	151.1	152.9	153.9	152.5	152.1	152.6	153.5
Unit nonlabor costs	161.8	162.1	151.9	156.6	158.9	161.2	161.3	165.9	164.7	163.1	161.2	159.6	158.4
Unit profits	88.9	122.1	108.6	104.2	90.8	90.3	91.2	83.0	96.1	115.0	131.5	143.6	146.9
Implicit price deflator	146.1	151.4	139.6	142.7	144.0	145.9	146.6	147.9	149.7	150.7	151.8	153.2	153.9
<b>Manufacturing:</b>													
Output per hour of all persons	106.5	113.1	106.1	104.4	105.2	105.4	107.8	107.8	109.5	111.7	114.9	116.0	116.8
Compensation per hour	158.2	166.7	147.0	150.5	155.2	157.2	159.6	161.2	165.1	166.0	167.1	168.7	171.3
Real compensation per hour	99.3	101.4	96.6	97.2	99.4	99.3	99.1	99.7	102.1	101.5	101.2	101.1	101.4
Unit labor costs	148.5	147.4	138.5	144.1	147.5	149.1	148.1	149.5	150.8	148.5	145.4	145.5	146.7

<sup>1</sup> Not available. r = revised.  
p = preliminary.

**32. Percent change from preceding quarter and year in productivity, hourly compensation, unit costs, and prices, seasonally adjusted at annual rate**

Item	Quarterly percent change at annual rate						Percent change from same quarter a year ago					
	III 1982 to IV 1982	IV 1982 to I 1983	I 1983 to II 1983	II 1983 to III 1983	III 1982 to IV 1983	IV 1983 to I 1984	IV 1981 to IV 1982	I 1982 to I 1983	II 1982 to II 1983	III 1982 to III 1983	IV 1982 to IV 1983	I 1983 to I 1984
<b>Business sector:</b>												
Output per hour of all persons . . . . .	3.2	1.9	5.9	1.2	4.2	r4.1	0.7	1.3	3.1	3.0	3.3	r3.9
Compensation per hour . . . . .	5.6	5.2	3.5	3.6	6.9	r5.9	7.0	6.0	5.2	4.5	4.8	5.0
Real compensation per hour . . . . .	4.0	4.9	-0.8	0.6	2.3	r0.9	2.4	2.3	1.9	1.8	1.4	0.5
Unit labor costs . . . . .	2.3	3.3	-2.2	2.3	2.5	r1.7	6.3	4.7	2.1	1.4	1.5	r1.1
Unit nonlabor payments . . . . .	3.2	10.6	14.4	5.4	6.2	r5.7	-2.0	2.8	6.4	8.3	9.1	r7.9
Implicit price deflator . . . . .	2.6	5.5	2.8	3.3	3.7	r3.0	3.5	4.1	3.4	3.6	3.8	r3.2
<b>Nonfarm business sector:</b>												
Output per hour of all persons . . . . .	1.2	3.5	7.1	2.3	2.7	r3.5	0.8	1.7	3.5	3.5	3.9	r3.9
Compensation per hour . . . . .	5.6	6.6	4.4	3.8	4.3	r6.0	7.1	6.3	5.9	5.1	4.8	4.6
Real compensation per hour . . . . .	4.0	6.3	0.0	-0.3	-0.1	1.0	2.5	2.6	2.5	2.5	1.4	r0.1
Unit labor costs . . . . .	4.4	3.0	-2.6	1.5	1.6	r2.4	6.3	4.6	2.3	1.5	0.8	r0.7
Unit nonlabor payments . . . . .	2.1	10.6	15.1	7.3	8.3	r1.4	-1.6	3.1	5.9	8.7	10.3	r7.9
Implicit price deflator . . . . .	3.7	5.3	2.7	3.3	3.7	r2.1	3.7	4.1	3.4	3.7	3.7	r2.9
<b>Nonfinancial corporations:</b>												
Output per hour of all employees . . . . .	0.4	3.2	6.6	4.2	3.4	p2.0	1.1	1.7	3.5	3.6	4.3	p4.6
Compensation per hour . . . . .	5.2	5.7	2.9	3.0	4.6	p4.5	6.9	5.7	5.0	4.2	4.1	p3.8
Real compensation per hour . . . . .	3.6	5.4	-1.4	-1.1	0.2	p-0.5	2.4	2.0	1.7	1.6	0.7	p-0.7
Total units costs . . . . .	6.7	1.0	-3.5	-2.1	0.2	p1.0	5.8	3.8	1.4	0.4	-1.2	p-1.2
Unit labor costs . . . . .	4.8	2.5	-3.4	-1.1	1.2	p2.5	5.7	3.9	1.5	0.6	-0.2	p-0.2
Unit nonlabor costs . . . . .	11.9	-2.8	-3.8	-4.7	4.0	p-2.7	6.0	3.7	1.2	-0.1	-3.8	p-3.8
Unit profits . . . . .	-31.4	79.9	104.7	71.0	42.4	p9.6	-20.3	5.8	27.3	44.2	73.1	p52.9
Implicit price deflator . . . . .	3.6	5.1	2.5	3.1	3.5	p1.9	3.6	4.0	3.3	3.6	3.6	p2.8
<b>Manufacturing:</b>												
Output per hour of all persons . . . . .	r0.2	r6.2	r8.5	r11.8	4.0	2.5	r3.3	r4.1	r6.0	r6.6	r7.6	r6.7
Compensation per hour . . . . .	4.0	10.0	2.1	-2.7	4.0	6.3	r7.1	6.4	5.6	4.7	4.7	3.8
Real compensation per hour . . . . .	2.4	9.7	-2.2	1.4	-0.4	1.3	r2.6	2.7	2.2	2.0	1.3	-0.7
Unit labor costs . . . . .	3.3	r3.6	r-5.9	r-8.1	-0.2	3.7	r-3.7	r2.2	r-0.4	r-1.8	r-2.7	r-2.7

<sup>1</sup>Not available.

r = revised.  
p = preliminary.



## WAGE AND COMPENSATION DATA

DATA FOR THE EMPLOYMENT COST INDEX are reported to the Bureau of Labor Statistics by a sample of 2,000 private nonfarm establishments and 750 State and local government units selected to represent total employment in those sectors. On average, each reporting unit provides wage and compensation information on five well-specified occupations.

**Data on negotiated wage and benefit changes** are obtained from contracts on file at the Bureau, direct contact with the parties, and secondary sources.

### Definitions

The **Employment Cost Index (ECI)** is a quarterly measure of the average change in the cost of employing labor. The rate of total compensation, which comprises wages, salaries, and employer costs for employee benefits, is collected for workers performing specified tasks. Employment in each occupation is held constant over time for all series produced in the ECI, except those by region, bargaining status, and area. As a consequence, only changes in compensation are measured. Industry and occupational employment data from the 1970 Census of Population are used in deriving constant weights for the ECI. While holding total industry and occupational employment fixed, in the estimation of indexes by region, bargaining status, and area, the employment in those measures is allowed to vary over time in accord with changes in the sample. The rate of change (in percent) is available for wages and salaries, as well as for total compensation. Data are collected for the pay period including the 12th day of the survey months of March, June, September, and December. The statistics are neither annualized nor adjusted for seasonal influence.

**Wages and salaries** consist of earnings before payroll deductions, excluding premium pay for overtime, work on weekends and holidays, and shift differentials. Production bonuses, incentive earnings, commissions, and cost-of-living adjustments are included; nonproduction bonuses are included with other supplemental pay items in the benefits category; and payments-in-kind, free room and board, and tips are excluded. *Benefits* include supplemental pay, insurance, retirement and savings plans, and hours-related and legally required benefits.

**Data on negotiated wage changes** apply to private nonfarm industry collective bargaining agreements covering 1,000 workers or more. Data on compensation changes apply only to those agreements covering 5,000 workers or more. *First-year* wage or compensation changes refer to average negotiated changes for workers covered by settlements reached in the period

and implemented within the first 12 months after the effective date of the agreement. *Changes over the life of the agreement* refer to all adjustments specified in the contract, expressed as an average annual rate. These measures exclude wage changes that may occur under cost-of-living adjustment clauses, that are triggered by movements in the Consumer Price Index. *Wage-rate changes* are expressed as a percent of straight-time hourly earnings; *compensation changes* are expressed as a percent of total wages and benefits.

**Effective wage adjustments** reflect all negotiated changes implemented in the reference period, regardless of the settlement date. They include changes from settlements reached during the period, changes deferred from contracts negotiated in an earlier period, and cost-of-living adjustments. The data also reflect contracts providing for no wage adjustment in the period. Effective adjustments and each of their components are prorated over all workers in bargaining units with at least 1,000 workers.

### Notes on the data

The Employment Cost Index data series began in the fourth quarter of 1975, with the quarterly percent change in wages and salaries in the private nonfarm sector. Data on employer costs for employee benefits were included in 1980, to produce a measure of the percent change in employers' cost for employees' total compensation. State and local government units were added to the ECI coverage in 1981, providing a measure of total compensation change in the civilian nonfarm economy.

Data for the broad white-collar, blue-collar, and service worker groups, and the manufacturing, nonmanufacturing, and service industry groups are presented in the ECI. Additional occupation and industry detail are provided for the wages and salaries component of total compensation in the private nonfarm sector. For State and local government units, additional industry detail is shown for both total compensation and its wages and salaries component.

Historical indexes (June 1981 = 100) of the quarterly rates of changes presented in the ECI are also available.

For a more detailed discussion of the ECI, see chapter 11, "The Employment Cost Index," of the *BLS Handbook of Methods* (Bulletin 2134-1), and the *Monthly Labor Review* articles: "Employment Cost Index: a measure of change in the 'price of labor,'" July 1975; "How benefits will be incorporated into the Employment Cost Index," January 1978; and "The Employment Cost Index: recent trends and expansion," May 1982.

Additional data for the ECI and other measures of wage and compensation changes appear in *Current Wage Developments*, a monthly publication of the Bureau.

### 33. Employment Cost Index, by occupation and industry group

[June 1981 = 100]

Series	1982				1983				1984	Percent change	
	March	June	Sept.	Dec.	March	June	Sept.	Dec.	March	3 months ended	12 months ended
										March 1984	
<b>Civilian workers<sup>1</sup></b>	106.3	107.5	110.1	111.4	113.2	114.5	116.5	117.8	119.8	1.7	5.8
Workers, by occupational group											
White-collar workers	106.5	107.7	110.7	111.9	113.7	114.9	117.6	118.9	120.9	1.7	6.3
Blue-collar workers	105.7	107.1	109.2	110.5	112.3	113.6	114.8	115.8	117.7	1.6	4.8
Service workers	107.2	108.3	110.8	112.4	114.3	115.1	116.7	119.1	122.0	2.4	6.7
Workers, by industry division											
Manufacturing	106.0	107.2	109.3	110.4	112.5	113.5	115.0	116.0	117.9	1.6	4.8
Nonmanufacturing	106.4	107.7	110.5	111.8	113.5	114.9	117.2	118.6	120.7	1.8	6.3
Services	108.2	109.2	113.5	115.0	116.6	117.1	121.1	122.6	125.0	2.0	7.2
Public administration <sup>2</sup>	108.1	109.1	112.8	113.6	116.2	117.0	119.8	121.4	122.9	1.2	5.8
<b>Private industry workers</b>	105.8	107.2	109.3	110.7	112.6	113.9	115.6	117.0	119.0	1.7	5.7
Workers, by occupational group											
White-collar workers	105.8	107.2	109.5	110.8	112.8	114.2	116.5	117.9	119.9	1.7	6.3
Blue-collar workers	105.6	107.0	109.0	110.3	112.1	113.5	114.6	115.7	117.5	1.6	4.8
Service workers	106.7	107.9	109.6	111.8	113.8	114.6	115.1	117.9	121.5	3.1	6.8
Workers, by industry division											
Manufacturing	106.0	107.2	109.3	110.4	112.5	113.5	115.0	116.0	117.9	1.6	4.8
Nonmanufacturing	105.7	107.1	109.3	110.8	112.6	114.2	116.0	117.5	119.6	1.8	6.2
<b>State and local government workers</b>	108.8	109.3	114.3	115.1	116.5	117.1	120.8	122.0	123.9	1.6	6.4
Workers, by occupational group											
White-collar workers	109.1	109.5	114.9	115.8	117.0	117.5	121.5	122.6	124.5	1.5	6.4
Blue-collar workers	108.2	108.9	112.7	113.0	114.9	115.8	118.0	119.2	121.9	2.3	6.1
Workers, by industry division											
Services	109.0	109.4	114.9	115.9	116.8	117.4	121.7	122.6	124.5	1.5	6.6
Schools	108.9	109.1	114.8	115.8	116.6	116.9	121.9	122.6	124.5	1.5	6.8
Elementary and secondary	109.3	109.5	115.6	116.6	117.2	117.4	123.3	123.9	125.4	1.2	7.0
Hospitals and other services <sup>3</sup>	109.5	110.3	115.3	116.0	117.5	118.8	121.1	122.6	124.4	1.5	5.9
Public administration <sup>2</sup>	108.1	109.1	112.8	113.6	116.2	117.0	119.8	121.4	122.9	1.2	5.8

<sup>1</sup>Excludes farm, household, and Federal workers.

<sup>2</sup>Consists of legislative, judicial, administrative, and regulatory activities.

<sup>3</sup>Includes, for example, library, social, and health services.

**34. Employment Cost Index, wages and salaries, by occupation and industry group**

[June 1981 = 100]

Series	1982				1983				1984	Percent change	
	March	June	Sept.	Dec.	March	June	Sept.	Dec.	March	3 months ended	12 months ended
										March 1984	
<b>Civilian workers<sup>1</sup></b>	106.3	107.3	109.7	110.9	112.2	113.4	115.3	116.5	117.9	1.2	5.1
Workers, by occupational group											
White-collar workers	106.7	107.6	110.4	111.4	113.0	114.2	116.7	117.9	119.3	1.2	5.6
Blue-collar workers	105.5	106.7	108.6	109.8	110.8	112.0	113.1	114.0	115.3	1.1	4.1
Service workers	106.8	107.9	110.1	111.8	113.2	113.9	115.1	117.4	120.0	2.2	6.0
Workers, by industry division											
Manufacturing	105.9	107.0	108.8	109.8	111.0	112.0	113.3	114.5	115.7	1.0	4.2
Nonmanufacturing	106.5	107.5	110.1	111.3	112.7	114.0	116.1	117.4	118.9	1.3	5.5
Services	108.6	109.5	113.2	114.4	115.8	116.3	120.1	121.3	123.3	1.6	6.5
Public administration <sup>2</sup>	107.5	108.4	111.9	112.6	114.6	115.4	118.2	119.4	120.4	0.8	5.1
<b>Private industry workers</b>	105.9	107.1	109.0	110.3	111.6	112.9	114.5	115.8	117.2	1.2	5.0
Workers, by occupational group											
White-collar workers	106.2	107.3	109.4	110.6	112.2	113.6	115.9	117.2	118.5	1.1	5.6
Professional and technical workers	108.0	109.4	111.8	112.9	114.8	115.9	119.9	120.4	122.2	1.5	6.4
Managers and administrators	105.8	107.2	108.5	109.3	112.0	114.0	114.8	115.7	118.0	2.0	5.4
Salesworkers	102.2	101.8	104.5	106.2	105.7	107.1	108.4	111.2	110.2	- .9	4.3
Clerical workers	107.0	108.3	110.3	111.6	113.4	114.6	116.7	118.3	119.8	1.3	5.6
Blue-collar workers	105.4	106.6	108.5	109.7	110.7	111.9	112.9	113.9	115.1	1.1	4.0
Craft and kindred workers	106.2	107.6	109.6	111.2	112.2	113.4	114.3	115.4	116.5	1.0	3.8
Operatives, except transport	105.4	106.6	108.3	109.3	110.0	111.1	112.3	113.6	114.9	1.1	4.5
Transport equipment operatives	103.2	104.1	106.0	106.9	108.0	110.3	110.7	110.2	111.7	1.4	3.4
Nonfarm laborers	104.1	105.1	106.5	107.8	109.0	109.8	110.8	112.1	112.9	.7	3.6
Service workers	106.7	107.9	109.3	111.4	112.9	113.5	113.7	116.5	119.8	2.8	6.1
Workers, by industry division											
Manufacturing	105.9	107.0	108.8	109.8	111.0	112.0	113.3	114.5	115.7	1.0	4.2
Durables	106.3	107.4	109.0	110.3	111.1	111.8	112.9	114.4	115.7	1.1	4.1
Nondurables	105.3	106.3	108.5	109.1	110.9	112.3	113.9	114.6	115.8	1.0	4.4
Nonmanufacturing	105.9	107.1	109.1	110.5	112.0	113.4	115.2	116.5	118.0	1.3	5.4
Construction	105.9	107.3	109.1	109.7	110.4	112.1	112.2	112.9	113.3	.4	2.6
Transportation and public utilities	105.7	106.9	109.5	111.1	112.9	114.7	115.7	116.8	118.5	1.5	5.0
Wholesale and retail trade	103.9	105.8	106.5	107.2	108.5	110.8	111.5	112.3	114.3	1.8	5.3
Wholesale trade	106.3	108.9	109.0	109.8	111.8	114.1	115.7	116.5	118.2	1.5	5.7
Retail trade	103.0	104.5	105.5	106.1	107.2	109.4	109.9	110.6	112.8	2.0	5.2
Finance, insurance, and real estate	103.7	102.4	106.1	109.0	110.6	111.1	113.5	116.9	116.1	-.7	5.0
Services	108.8	110.0	112.5	114.3	116.0	116.6	120.4	121.9	124.2	1.9	7.1
<b>State and local government workers</b>	108.2	108.7	113.5	114.0	115.1	115.7	119.2	120.0	121.6	1.3	5.6
Workers, by occupational group											
White-collar workers	108.5	108.9	114.2	114.6	115.6	116.1	119.8	120.6	122.2	1.3	5.7
Blue-collar workers	107.5	107.9	111.5	112.0	113.3	114.3	116.4	116.9	119.1	1.9	5.1
Workers, by industry division											
Services	108.4	108.8	114.2	114.6	115.5	115.9	119.8	120.6	122.2	1.3	5.8
Schools	108.3	108.5	114.2	114.5	115.2	115.4	119.9	120.6	122.2	1.3	6.1
Elementary and secondary	108.7	108.8	114.9	115.1	115.6	115.8	121.1	121.7	122.9	1.0	6.3
Hospitals and other services <sup>3</sup>	108.8	109.5	114.3	114.9	116.5	117.7	119.7	120.6	121.9	1.1	4.6
Public administration <sup>2</sup>	107.5	108.4	111.9	112.6	114.6	115.4	118.2	119.4	120.4	.8	5.1

<sup>1</sup>Excludes farm, household, and Federal workers.

<sup>3</sup>Includes, for example, library, social, and health services.

<sup>2</sup>Consists of legislative, judicial, administrative, and regulatory activities.



### 35. Employment Cost Index, private industry workers, by bargaining status, region, and area size

[June 1981 = 100]

Series	1982				1983				1984	Percent change	
	March	June	Sept.	Dec.	March	June	Sept.	Dec.	March	3 months ended	12 months ended
										March 1984	
<b>COMPENSATION</b>											
Workers, by bargaining status <sup>1</sup>											
Union	106.5	108.4	110.6	112.3	114.5	116.0	117.8	118.8	120.6	1.5	5.3
Manufacturing	106.3	108.0	110.3	111.8	114.0	114.8	116.3	117.2	119.3	1.8	4.6
Nonmanufacturing	106.8	108.7	111.0	112.8	114.9	117.1	119.2	120.4	121.9	1.2	6.1
Nonunion	105.3	106.5	108.5	109.7	111.5	112.8	114.4	115.9	118.0	1.8	5.8
Manufacturing	105.7	106.6	108.4	109.2	111.2	112.3	113.8	114.9	116.6	1.5	4.9
Nonmanufacturing	105.2	106.4	108.6	109.9	111.6	113.0	114.7	116.4	118.6	1.9	6.3
Workers, by region <sup>1</sup>											
Northeast				111.7	112.6	114.3	116.0	117.5	118.9	1.2	5.6
South				110.6	112.5	113.5	115.6	117.1	119.7	2.2	6.4
North Central				108.6	110.9	112.5	113.9	114.7	117.2	2.2	5.7
West				112.9	115.4	116.6	118.0	120.0	121.0	0.8	4.9
Workers, by area size <sup>1</sup>											
Metropolitan areas	105.7	107.2	109.4	110.9	112.9	114.2	116.0	117.4	119.4	1.7	5.8
Other areas	106.2	107.0	108.6	109.1	110.8	112.3	113.4	114.5	116.7	1.9	5.3
<b>WAGES AND SALARIES</b>											
Workers, by bargaining status <sup>1</sup>											
Union	106.5	108.1	110.3	111.8	112.9	114.2	116.0	116.9	118.1	1.0	4.6
Manufacturing	105.9	107.3	109.5	110.8	111.4	112.3	113.7	114.8	116.1	1.1	4.2
Nonmanufacturing	107.0	108.8	111.1	112.7	114.3	116.0	118.3	118.9	120.1	1.0	5.1
Nonunion	105.6	106.5	108.3	109.5	110.9	112.2	113.7	115.2	116.7	1.3	5.2
Manufacturing	105.9	106.7	108.2	109.1	110.7	111.8	113.0	114.2	115.4	1.1	4.2
Nonmanufacturing	105.5	106.4	108.3	109.6	111.0	112.4	114.0	115.6	117.2	1.4	5.6
Workers, by region <sup>1</sup>											
Northeast	106.1	106.7	109.7	111.5	112.0	113.6	115.3	116.6	117.4	.7	4.8
South	105.7	107.4	108.8	109.8	111.4	112.5	114.3	115.7	117.9	1.9	5.8
North Central	104.7	106.1	107.6	108.6	110.1	111.5	112.8	113.6	115.5	1.7	4.9
West	107.9	108.6	110.7	112.0	114.1	114.9	116.5	118.5	118.8	.3	4.1
Workers by area size <sup>1</sup>											
Metropolitan areas	105.9	107.1	109.1	110.5	111.9	113.2	114.9	116.2	117.6	1.2	5.1
Other areas	106.0	106.8	108.3	108.8	110.1	111.4	112.3	113.4	115.1	1.5	4.5

<sup>1</sup>The indexes are calculated differently from those for the occupation and industry groups. For a detailed description of the index calculation, see BLS *Handbook of Methods*, Bulletin 1910.

**36. Wage and compensation change, major collective bargaining settlements, 1979 to date**

[In percent]

Measure	Annual average					Quarterly average								
	1979	1980	1981	1982	1983	1982				1983				1984 <sup>P</sup>
						I	II	III	IV	I	II	III	IV	I
Total compensation changes, covering 5,000 workers or more, all industries:														
First year of contract	9.0	10.4	10.2	3.2	3.4	1.9	2.6	6.2	3.3	-1.6	4.4	5.0	4.9	5.3
Annual rate over life of contract	6.6	7.1	8.3	2.8	3.0	1.2	2.1	4.7	4.8	1.4	3.6	4.3	3.1	5.0
Wage rate changes covering at least 1,000 workers, all industries:														
First year of contract	7.4	9.5	9.8	3.8	2.6	3.0	3.4	5.4	3.8	-1.2	2.7	3.7	4.2	3.0
Annual rate over life of contract	6.0	7.1	7.9	3.6	2.8	2.8	3.2	4.5	4.8	2.2	2.8	3.6	2.8	3.4
Manufacturing:														
First year of contract	6.9	7.4	7.2	2.8	0.4	2.5	1.8	5.1	4.1	-3.4	1.3	3.4	2.9	3.1
Annual rate over life of contract	5.4	5.4	6.1	2.6	2.1	2.7	1.7	3.9	4.5	.9	1.7	3.5	3.1	2.7
Nonmanufacturing (excluding construction):														
First year of contract	7.6	9.5	9.8	4.3	5.0	2.7	6.6	5.5	3.6	3.3	5.9	5.8	4.8	4.3
Annual rate over life of contract	6.2	6.6	7.3	4.1	3.7	2.1	6.1	4.8	5.2	5.3	5.2	4.3	2.7	4.9
Construction:														
First year of contract	8.8	13.6	13.5	6.5	1.5	8.6	6.2	6.3	3.4	.7	1.7	1.5	1.1	-5.4
Annual rate over life of contract	8.3	11.5	11.3	6.3	2.4	8.2	6.3	5.9	2.9	2.4	2.1	2.9	2.6	-4.2

p = preliminary.

**37. Effective wage adjustments in collective bargaining units covering 1,000 workers or more, 1979 to date**

Measure	Year					Year and quarter								
	1979	1980	1981	1982	1983	1982				1983				1984 <sup>P</sup>
						I	II	III	IV	I	II	III	IV	I
Average percent adjustment (including no change):														
All industries	9.1	9.9	9.5	6.8	4.0	1.0	2.0	2.4	1.3	0.3	1.3	1.2	1.1	0.9
Manufacturing	9.6	10.2	9.4	5.2	2.7	.9	1.0	1.7	1.5	-.5	1.1	1.2	.9	1.2
Nonmanufacturing	8.8	9.7	9.5	7.9	4.8	1.1	2.7	2.9	1.2	.9	1.5	1.2	1.2	.7
From settlements reached in period	3.0	3.6	2.5	1.7	.8	.2	.4	.5	.6	-.2	.3	.2	.6	.1
Deferred from settlements reached in earlier period	3.0	3.5	3.8	3.6	2.5	.6	1.4	1.3	.4	.4	1.0	.8	.3	.4
From cost-of-living clauses	3.1	2.8	3.2	1.4	.6	.3	.2	.6	.3	.1	.1	.2	.2	.4
Total number of workers receiving wage change (in thousands) <sup>1</sup>														
From settlements reached in period	—	—	2,270	1,907	2,327	204	511	620	825	448	561	599	996	272
Deferred from settlements reached in earlier period	—	—	6,267	4,846	3,260	1,001	1,594	2,400	860	812	1,405	1,317	669	1,049
From cost-of-living clauses	—	—	4,593	3,830	2,327	1,920	1,568	2,251	1,970	1,938	1,299	1,218	1,290	1,640
Number of workers receiving no adjustments (in thousands)	—	—	145	483	1,187	5,457	4,912	4,575	4,895	4,842	4,656	4,693	4,830	4,791

<sup>1</sup>The total number of workers who received adjustments does not equal the sum of workers that received each type of adjustment, because some workers received more than one type of adjustment during the period.

p = preliminary.

## WORK STOPPAGE DATA

WORK STOPPAGES include all known strikes or lockouts involving 1,000 workers or more and lasting a full shift or longer. Data are based largely on newspaper accounts and cover all workers idle one shift or more in establishments directly involved in a stoppage. They do not measure the indirect or secondary effect on other establishments whose employees are idle owing to material or service shortages.

Estimates of days idle as a percent of estimated working time measure only the impact of larger strikes (1,000 workers or more). Formerly, these estimates measured the impact of strikes involving 6 workers or more; that is, the impact of virtually *all* strikes. Due to budget stringencies, collection of data on strikes involving fewer than 1,000 workers was discontinued with the December 1981 data.

38. Work stoppages involving 1,000 workers or more, 1947 to date							
Month and year	Number of stoppages		Workers involved		Days idle		
	Beginning in month or year	In effect during month	Beginning in month or year (in thousands)	In effect during month (in thousands)	Number (in thousands)	Percent of estimated working time	
1947	270		1,629		25,720	—	
1948	245		1,435		26,127	.22	
1949	262		2,537		43,420	.38	
1950	424		1,698		30,390	.26	
1951	415		1,462		15,070	.12	
1952	470		2,746		48,820	.38	
1953	437		1,623		18,130	.14	
1954	265		1,075		16,630	.13	
1955	363		2,055		21,180	.16	
1956	287		1,370		26,840	.20	
1957	279		887		10,340	.07	
1958	332		1,587		17,900	.13	
1959	245		1,381		60,850	.43	
1960	222		896		13,260	.09	
1961	195		1,031		10,140	.07	
1962	211		793		11,760	.08	
1963	181		512		10,020	.07	
1964	246		1,183		16,220	.11	
1965	268		999		15,140	.10	
1966	321		1,300		16,000	.10	
1967	381		2,192		31,320	.18	
1968	392		1,855		35,567	.20	
1969	412		1,576		29,397	.16	
1970	381		2,468		52,761	.29	
1971	298		2,516		35,538	.19	
1972	250		975		16,764	.09	
1973	317		1,400		16,260	.08	
1974	424		1,796		31,809	.16	
1975	235		965		17,563	.09	
1976	231		1,519		23,962	.12	
1977	298		1,212		21,258	.10	
1978	219		1,006		23,774	.11	
1979	235		1,021		20,409	.09	
1980	187		795		20,844	.09	
1981	145		729		16,908	.07	
1982	96		656		9,061	.04	
1983	81		909		17,461	.08	
1983	January	1	3	1.6	38.0	794.8	.04
	February	5	7	14.0	50.4	844.4	.05
	March	5	10	10.5	54.9	1,131.5	.05
	April	2	9	2.8	52.4	789.5	.04
	May	12	17	24.9	34.2	488.5	.03
1984 <sup>p</sup>	January	6	12	28.9	43.0	507.3	.03
	February	2	12	8.7	37.2	365.5	.02
	March	2	9	3.0	14.6	284.2	.01
	April	6	12	27.0	36.6	643.5	.03
	May	3	12	4.0	33.6	530.1	.03

p = preliminary.

r = revised.



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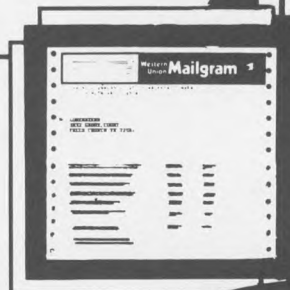
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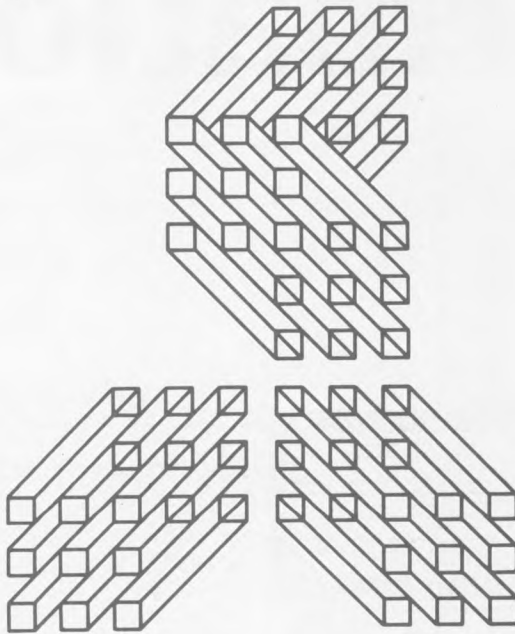
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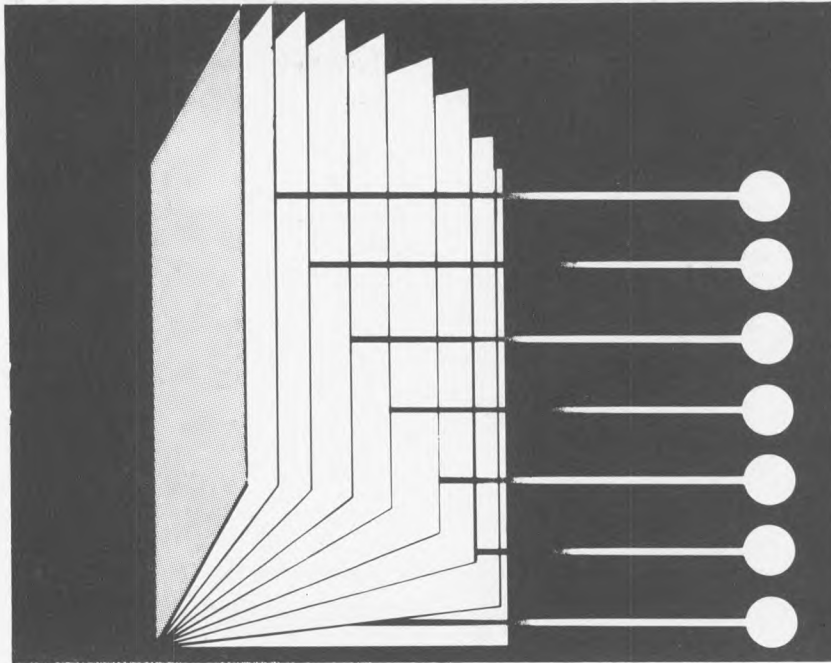
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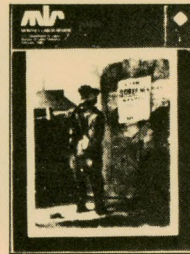
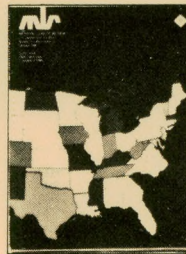
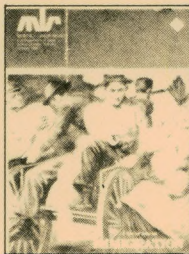
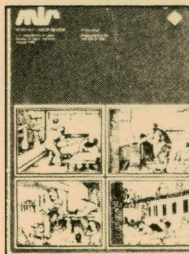
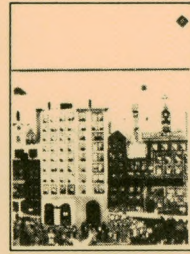






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