Black college graduates in the labor market, 1979 and 1989

Although college-educated black and white women have very similar earnings, substantial economic differences still exist between college-educated black and white men

Joseph R. Meisenheimer II

"There is no defense or security for any of us except in the highest intelligence and development of all."

—Booker T. Washington, from a speech made in Atlanta on September 18, 1895

Black educator Booker T. Washington espoused the philosophy that education is the path to economic and social equality for blacks. Indeed, education, particularly college education, has long been regarded as the path to expanded job opportunities, higher earnings, and enhanced social standing for all people.

A substantial educational gap between whites and blacks has narrowed over time, but it still persists. In 1979, 9 percent of blacks ages 25 to 64 had completed 4 or more years of college; by comparison, 19 percent of whites had done so. The 1980's saw considerable progress for both groups, but no narrowing of the gap; in 1989, 13 percent of blacks and 24 percent of whites had completed 4 or more years of college.[1]

Many of the economic disparities between blacks and whites have been attributed, in large part, to the relatively lower educational levels (human capital) of blacks.[2] And much of the improvement in the economic status of blacks over time has been attributed to their increasing educational levels.[3] Differences in education, however, do not completely explain the labor market disparities between blacks and whites. For example, among college-educated men, black graduates have substantially higher unemployment rates and lower median earnings than their white counterparts.

This article compares the labor market experience of civilian college graduates by sex and race in 1989 and looks at the changes that took place for these groups over the preceding decade. It then examines the economic rewards of higher education for blacks by comparing the employment and earnings characteristics of black college graduates with those of black high school graduates. The data used are from the Current Population Survey (CPS), a sample survey of about 60,000 households, conducted monthly for the Bureau of Labor Statistics by the Bureau of the Census.[4]

College-graduate differences

Some differences between black and white college graduates in their labor market characteristics stem from differences in the age and sex composition of the two groups. For example, black college graduates are somewhat younger than their white counterparts. In 1989, 39 percent of black graduates (ages 25 to 64) were in the youngest age group—25 to 34—compared with 34 percent of white graduates, reflecting the fact that relatively fewer older blacks attended college. Another demographic difference

Joseph R. Meisenheimer II is an economist in the Division of Labor Force Statistics, Bureau of Labor Statistics.

between black and white college graduates is that a larger share of black graduates are women—54 percent in 1989 and 53 percent in 1979.[5] By comparison, 44 percent of white graduates in 1989 and 40 percent in 1979 were women. These age and gender differences can distort racial comparisons. For this reason, an examination of labor force characteristics should focus on *specific* age and sex groups.

Differences in education do not completely explain labor market disparities between blacks and whites.

Labor force participation. The labor force participation rate is the proportion of a population group that is either employed or actively seeking employment. The incidence of labor force participation differs substantially between the sexes, in that men participate at higher rates than women at every age. As shown in table 1, among men ages 25 to 64, black college graduates' rates were just below those of their white counterparts in both 1979 (92.9 to 95.7) and 1989 (93.3 to 95.1). The gap grows larger at successively lower educational levels. For example, among men with 4 years of high school, the participation rate for blacks in 1989 was nearly 4 percentage points lower than that for whites, and among those who did not complete high school, the spread was about 12 points.

Table 1 also shows that college-educated black women participate in the labor force at much *higher* rates than their white peers, although that gap narrowed considerably during the 1980's.

Table 1. **Labor force participation rates for 25- to 64-year-olds by educational attainment, sex, and race, annual averages, 1979 and 1989**

[In percent]

Educational attainment and sex	1979		1989	
	Black	White	Black	White
4 or more years of college				
Men	92.9	95.7	93.3	95.1
Women	86.5	70.3	88.4	80.4
1 to 3 years of college				
Men	91.3	93.2	90.1	92.6
Women	78.7	62.5	80.2	75.0
4 years of high school				
Men	90.5	92.5	86.8	90.4
Women	69.7	58.8	72.9	67.7
Less than 4 years of high school				
Men	76.6	81.6	67.0	78.5
Women	48.1	43.5	46.6	47.2

Other than the participation rates for high school dropouts, which are essentially the same for both races, black women have higher rates than white women at each level of education. The gap is largest among college graduates, however. Table 2 provides a more complete look at the participation rates of college graduates by race, sex, and age.

To shed some light on the gap in labor force participation, it is helpful to look at the marital status of women of each race. In all four educational levels, a smaller proportion of black women than white women is married (and living with their husbands). In 1989, less than half of black college-educated women lived with their husbands, compared with more than two-thirds of college-educated white women. Additionally, married black women participated in the labor force at much higher rates than whites in both years studied, despite a sharp increase in participation among married white women during the 1980's. In 1979, the labor force participation rates were 83.7 percent for married black women and 63.2 percent for married white women. By 1989, these rates were 85.7 percent for black women and 75.1 percent for white women. These differences cannot be explained by age. In fact, both groups of married women had virtually identical age distributions in the years studied. The following tabulation shows the percent distribution of married female college graduates by age:

	1979		*1989*	
	Black	*White*	*Black*	*White*
25 to 64	100	100	100	100
25 to 34	44	44	35	34
35 to 44	27	26	37	37
45 to 54	19	17	19	18
55 to 64	10	12	9	11

The difference in labor force participation rates between black and white married women may be partly explained by the labor force experience and educational level of their husbands. If a husband is not employed or, if employed, has relatively low earnings, the wife is more likely to work. Also, if the wife has a higher level of educational attainment and has a higher earnings potential than her husband, she would have greater incentive to work.

In fact, the husbands of college-educated black women have less schooling and make less money than the husbands of white women. Half of the husbands of college-educated black women have completed 4 years of college, compared with 72 percent of the husbands of college-educated white women. Furthermore, 12 percent of these married black women, compared with 7 percent of their white counterparts, had husbands who were either unemployed or not in the labor

Table 2. **Population, labor force, and labor force participation rates of 25- to 64-year-olds with 4 or more years of college by sex, race, and age, annual averages, 1979 and 1989**

[Numbers in thousands]

Sex, race, and age	1979			1989		
	Population	Labor force	Labor force participation rate	Population	Labor force	Labor force participation rate
Men						
Black, total	466	433	92.9	852	795	93.3
25 to 34	218	203	93.1	321	315	98.1
35 to 44	131	127	96.9	290	275	94.8
45 to 54	76	72	94.7	154	145	94.2
55 to 64	40	31	(1)	86	60	69.8
White, total	10,490	10,040	95.7	14,406	13,694	95.1
25 to 34	4,320	4,170	96.5	4,531	4,392	96.9
35 to 44	2,732	2,687	98.4	5,012	4,930	98.4
45 to 54	2,106	2,050	97.3	2,890	2,798	96.8
55 to 64	1,331	1,133	85.1	1,972	1,575	79.9
Women						
Black, total	524	453	86.5	1,003	887	88.4
25 to 34	258	228	88.4	395	360	91.1
35 to 44	122	111	91.0	337	310	92.0
45 to 54	94	80	85.1	178	160	89.9
55 to 64	50	34	(1)	92	57	62.0
White, total	7,059	4,959	70.3	11,411	9,174	80.4
25 to 34	3,281	2,456	74.9	4,342	3,638	83.8
35 to 44	1,711	1,203	70.3	3,913	3,224	82.4
45 to 54	1,185	833	70.3	1,945	1,607	82.6
55 to 64	882	467	52.9	1,210	705	58.3

[1] Data not shown where base is less than 75,000.

force in 1989. Among those women whose husbands were employed as wage and salary workers, 52 percent of whites, compared with 28 percent of blacks had husbands who earned $700 or more per week. In contrast, 43 percent of blacks and 24 percent of whites had husbands who earned less than $500 per week.

Among unmarried women ages 25 to 64 (and the relatively few who are married, but not living with their husbands), the participation rates for blacks (91.1 percent) and whites (91.5 percent) were virtually identical in 1989. But because a much larger proportion of black than white women was unmarried, this group, which has high participation regardless of race, had a greater effect on the overall participation rate for black women than it did for white women.

Unemployment. Black labor force participants have historically been more than twice as likely as their white counterparts to be unemployed. Although this differential has been attributed in large part to the lower educational attainment of blacks,[6] the rates for blacks are also higher than those for whites at *each* level of education. In 1989, the unemployment rate for college-educated black men ages 25 to 64 was about three times the rate for white men (5.6 versus 1.8 percent). This is higher than 10 years earlier, when the unemployment rate for similarly educated black men (3.7 percent) was two-and-a-half times the rate for white men (1.5 percent).[7] The unemployment rate for college-educated black women was 3.9 percent in 1989, up slightly from 3.4 percent in 1979, while that for white women decreased to 2.3 from 3.1 percent.[8]

Earnings. A comparison of the earnings of black and white college graduates can be affected not only by race, but other factors, including gender and age. Men generally earn more than women, and older workers generally earn more than younger workers.[9] As stated earlier, a greater share of black than white college graduates are women, and black graduates typically are younger than their white counterparts.

Black and white college-educated men have sharply different occupations.

Earnings comparisons can also be affected by differences in the amount of time spent working. For example, if the median annual earnings were compared for two worker groups who have otherwise similar characteristics, the group with the larger proportion of year-round, full-time workers

would likely have higher annual earnings. The following tabulation shows that, among college graduates who work, a slightly smaller percentage of black men than white men do so year round and full time (defined here as working at least 50 weeks in a year and at least 35 hours in a majority of those weeks), while black women are considerably more likely than white women to do so.

	1979		*1989*	
	Black	*White*	*Black*	*White*
Men	81	86	82	85
Women	65	54	72	62

Because of the different proportions of black and white men and women who work year round and full time, median annual earnings are compared not only for all college graduates with earnings, but also for the more homogeneous group of year-round, full-time earners. As the following tabulation shows, when all 25- to 64-year-old earners are compared, black men earn considerably less than white men, while black women earn considerably more than white women. Among year-round, full-time workers, the gap in annual earnings between black and white men is still substantial, while the median earnings for black and white women grow closer.

	1979		*1989*	
	Black	*White*	*Black*	*White*
All earners:				
Men	$17,083	$21,278	$27,966	$37,234
Women ...	12,152	7,930	23,928	19,966
Year-round, full-time earners:				
Men	$19,587	$23,085	$31,349	$41,653
Women ...	15,283	14,066	26,765	27,473

While these data provide some insight into the effects of race and sex on the earnings of college graduates, they mask the effects of age. The sample size of the March CPS, from which the data on annual earnings are obtained, is not large enough to provide reliable estimates of *annual* earnings for race-sex-age groups. In order to deal with this data limitation, annual averages of median *weekly* earnings are compared for wage and salary workers who usually work full time (35 hours or more per week). These averages, which are based on data collected over an entire year, are more reliable than the annual earnings estimates, which are

Table 3. **Median weekly earnings of employed full-time wage and salary workers ages 25 to 64 with 4 or more years of college by sex, age, and race, annual averages, 1979 and 1989**

[Numbers in thousands]

Sex and age	Black			White		
	Number of workers	Median earnings	90-percent confidence interval	Number of workers	Median earnings	90-percent confidence interval
1979						
Men 25 to 64	371	$338	$320 to $356	7,756	$399	$396 to $402
25 to 34 years	187	303	284 to 322	3,460	339	334 to 344
35 to 44 years	102	369	325 to 413	2,050	440	430 to 450
45 to 64 years	82	398	369 to 427	2,246	480	474 to 486
45 to 54 years	60	418	384 to 452	1,483	488	481 to 495
55 to 64 years	23	353	313 to 393	763	457	440 to 474
Women 25 to 64	403	261	253 to 269	3,482	265	262 to 268
25 to 34 years	204	243	232 to 254	1,792	250	247 to 253
35 to 44 years	94	273	255 to 291	780	281	274 to 288
45 to 64 years	105	286	271 to 301	910	292	285 to 299
45 to 54 years	74	279	261 to 297	585	292	283 to 301
55 to 64 years	31	301	276 to 326	325	294	283 to 305
1989						
Men 25 to 64	631	544	523 to 565	10,410	719	713 to 725
25 to 34 years	259	479	462 to 496	3,677	603	596 to 610
35 to 44 years	214	583	560 to 606	3,714	761	751 to 771
45 to 64 years	159	667	621 to 713	3,019	845	829 to 861
45 to 54 years	115	636	556 to 716	2,024	855	834 to 876
55 to 64 years	44	707	636 to 778	994	829	805 to 853
Women 25 to 64	768	486	475 to 497	6,536	510	507 to 513
25 to 34 years	301	426	410 to 442	2,800	480	475 to 485
35 to 44 years	274	516	498 to 534	2,186	533	522 to 544
45 to 64 years	193	522	497 to 547	1,550	559	544 to 574
45 to 54 years	142	521	498 to 544	1,102	557	540 to 574
55 to 64 years	50	535	359 to 711	448	569	540 to 598

based on data obtained in only a single month.[10] But even in the case of weekly earnings, some estimates still may have a wide margin of error because they represent relatively small population groups. To aid in the analysis, the margins of error—confidence intervals—have been estimated for the median weekly earnings of each race-sex-age group.[11]

As table 3 shows, college-educated black men ages 25 to 64 had median weekly earnings in 1989 of $544 (plus or minus $21), compared with $719 (plus or minus $6) for their white counterparts. This means that the median earnings of these black men ranged from 72 to 79 percent of the median for white men.[12] This gap was greater than that 10 years earlier, when college-educated black men earned 80 to 90 percent as much as their white counterparts. The increase in the earnings gap from 1979 to 1989 was concentrated primarily among men ages 25 to 34. This is shown in the following tabulation of confidence intervals of the black-to-white earnings ratios for each age group.

	1979	*1989*
Men ages 25 to 64	80–90	72–79
25 to 34	83–96	76–83
35 to 44	72–96	73–81
45 to 54	78–94	63–86
55 to 64	66–89	75–97

For the years studied, these confidence intervals overlap in all but the 25- to 34-year age group. This means that the only statistically significant decline in the black-to-white earnings ratio occurred among young men. It is possible, however, that the earnings gap also increased for the other age groups because, for all but 55- to 64-year-olds, the upper boundaries of the confidence intervals were lower in 1989 than in 1979.

In contrast to the substantial earnings gap between black and white men, college-educated women of each race had nearly equal median weekly earnings in both years studied. This was the case in all age groups, except for 25- to 34-year-olds. There was little difference in the earnings of women in this age group in 1979, but 10 years later, the median for young black women

Table 4. **Employed 25- to 64-year-olds with 4 or more years of college by occupation, sex, and race, annual averages, 1989**

[Numbers in thousands]

Occupation	Men				Women			
	Black		White		Black		White	
	Employed	Percent	Employed	Percent	Employed	Percent	Employed	Percent
Total	751	100.0	13,444	100.0	853	100.0	8,967	100.0
Managerial and professional specialty	404	53.8	8,964	66.7	555	65.1	6,225	69.4
Executive, administrative, and managerial	168	22.4	3,962	29.5	148	17.4	1,705	19.0
Professional specialty	236	31.4	5,002	37.2	407	47.7	4,521	50.4
Engineers	30	4.0	1,000	7.4	6	.7	68	.8
Mathematical and computer scientists	15	2.0	295	2.2	9	1.1	133	1.5
Natural scientists	7	.9	219	1.6	5	.6	69	.8
Health diagnosing	24	3.2	559	4.2	2	.2	102	1.1
Health assessment and treating	6	.8	198	1.5	69	8.1	849	9.5
Teachers, college and university	12	1.6	328	2.4	9	1.1	206	2.3
Teachers, other	63	8.4	794	5.9	218	25.6	2,007	22.4
Lawyers and judges	16	2.1	526	3.9	10	1.2	137	1.5
Other professional specialty	63	8.4	1,084	8.1	78	9.1	949	10.6
Technical, sales, and administrative support	187	24.9	2,962	22.0	250	29.3	2,244	25.0
Technicians and related support	38	5.1	533	4.0	45	5.3	370	4.1
Sales	75	10.0	1,912	14.2	42	4.9	753	8.4
Supervisors and proprietors	22	2.9	596	4.4	14	1.6	189	2.1
Finance and business	21	2.8	609	4.5	16	1.9	266	3.0
Commodities except retail	16	2.1	475	3.5	3	.4	100	1.1
Retail and personal	15	2.0	231	1.7	9	1.1	192	2.1
Administrative support, including clerical	74	9.9	517	3.8	163	19.1	1,122	12.5
Service occupations	66	8.8	352	2.6	30	3.5	302	3.4
Precision production, craft, and repair	46	6.1	650	4.8	5	.6	67	.7
Operators, fabricators, and laborers	44	5.9	360	2.7	13	1.5	81	.9
Farming, forestry, and fishing	3	.4	156	1.2	([1])	([2])	47	.5

[1] Less than 500.

[2] Less than 0.05 percent.

Table 5. **Employment-population ratios of blacks ages 25 to 64 by sex, age, marital status, and educational attainment, annual averages, 1979 and 1989**

[In percent]

Sex, age, and marital status	1979		1989	
	4 or more years of college	4 years of high school	4 or more years of college	4 years of high school
Men	89.5	84.3	88.1	78.7
25 to 34	88.1	85.2	92.8	79.3
35 to 44	94.7	87.4	89.0	84.6
45 to 54	92.1	84.9	89.0	80.3
55 to 64	([1])	72.3	67.4	58.1
Women	83.4	63.5	85.0	66.2
25 to 34	84.5	62.9	85.1	63.1
35 to 44	87.7	68.6	89.9	74.7
45 to 54	84.0	63.9	87.6	70.9
55 to 64	([1])	51.4	62.0	47.1
Married women, spouse present	81.0	63.0	82.7	68.8
Unmarried women [2]	86.1	64.1	87.2	64.2

[1] Data not shown where base is less than 75,000.

[2] Includes married women not living with their husbands.

was 84 to 93 percent that of their white counterparts. This divergence might be explained partly by differences in the proportion of college-educated women of each race who had some graduate schooling. Workers with graduate schooling tend to earn more than those with exactly 4 years of college. In 1979, among full-time wage and salary workers, nearly equal proportions of black and white women ages 25 to 34 had completed more than 4 years of college, whereas in 1989, a substantially larger proportion of whites than blacks had done so. This development does not explain the divergence in earnings entirely, however, because an earnings gap also developed during the 1980's among young black and white women with exactly 4 years of college.

Why do black and white female college graduates have very similar median earnings, while black men earn less than their white peers? A look at occupational employment characteristics provides some answers. As can be seen in table 4, black and white women work in very similar occupations. Nearly equal proportions of employed blacks (17 percent) and whites (19 percent) are managers. Roughly half of both groups work in professional specialty occupations, and, among these professionals, over two-thirds of blacks and nearly two-thirds of whites work either as teachers (below the college or university level) or in health assessment and treating jobs (such as nurses and therapists). The only significant dissimilarity in occupational distributions is that 19 percent of blacks, and 13 percent of whites, work in administrative support, including clerical jobs.

In contrast to the situation among women, black and white college-educated men have sharply different occupations and these differences are consistent with the lower median earnings of blacks. For instance, in 1989, 22 percent of employed black men, compared with 29 percent of white men, were managers. Black men were also less likely than white men to work in professional specialty occupations (31 versus 37 percent). Among professional men, more than one-quarter of blacks, but less than one-sixth of whites, worked in teaching, a relatively lower paying professional occupation. Nearly half of white professionals worked as engineers, mathematicians and computer scientists, lawyers and judges, or doctors, while slightly more than one-third of black professionals worked in these higher paying jobs.

College-educated black men are considerably more likely than their white counterparts to work outside of managerial and professional fields. In fact, 31 percent of black men, compared with 14 percent of white men worked in one of the following lower paying occupations that typically do not require a college degree: administrative support (including clerical work); service; precision production, craft, and repair; and operators, fabricators, and laborers.[13]

In addition to the occupational differences, a number of other factors may contribute to this earnings gap. These include the degree attained (workers with master's degrees tend to earn more than those with bachelor's degrees), the amount of training received on the job, local labor market factors, job performance, the size and financial strength of employers, and racial discrimination.[14]

College versus high school

Two key economic rewards of higher education are enhanced employment opportunities and higher earnings. In the following analysis, these economic rewards are examined for blacks by comparing the labor market experience of black college and high school graduates in terms of employment and of median weekly earnings of those employed as full-time wage and salary workers.

The employment-population ratio—the proportion of a population group that is employed—reflects both the extent of a group's labor force participation and the success of the participants in finding work. College graduates participate in the labor force—that is, work or actively seek work—at a higher rate than do high school graduates. In large part, this is because college graduates have invested more in their education and

have greater expectations of employment than high school graduates. Thus, college graduates have more to lose by not going actively into the labor market. Also, college graduates are more likely to succeed in finding work. These two factors result in higher employment-population ratios for college graduates.

Table 5 shows that, in 1989, the employment-population ratio of college-educated black men was 9 percentage points higher than that of black male high school graduates. In 1979, the difference was 5 percentage points. This widening resulted largely from a decline of nearly 4 percentage points in the labor force participation rate of high school graduates. High school graduates may have become less likely to look for work due to a perception that their job prospects had worsened.[15]

Among black women, the employment ratio for college graduates in both years studied was about 20 percentage points higher than that for high school graduates. The difference was even larger among unmarried women (23 percentage points in 1989) than it was for married women (14 percentage points).

The 2 years selected for comparing black college and high school graduates' employment ratios were periods of economic expansion. If these ratios had been compared for recession years, the difference between college and high school graduates would have been even greater. This is because the types of jobs held by college graduates are less vulnerable to recessionary job losses.[16]

In the future, regardless of the stage of the business cycle, this employment gap between black college and high school graduates may grow. According to Bureau of Labor Statistics' projections, the occupations expected to have the fastest rates of employment growth between 1988 and 2000 are in managerial, professional, and technical fields, which generally require higher levels of education. In contrast, employment is projected to grow more slowly or even decline in many of the occupations requiring less education.[17] How much the employment ratios of black college and high school graduates will be affected by these projected changes in the occupational structure of the labor market depends, for the

The earnings gap between black college and high school graduates has increased in the 1980's.

Table 6. **Median weekly earnings of blacks ages 25 to 64 employed as full-time wage and salary workers by sex, age, and educational attainment, annual averages, 1979 and 1989**

[Numbers in thousands]

Sex and age	4 or more years of college			4 years of high school		
	Number of workers	Median earnings	90-percent confidence interval	Number of workers	Median earnings	90-percent confidence interval
1979						
Men 25 to 64	371	$338	$320 to $356	1,168	$251	$244 to $258
25 to 34 years	187	303	284 to 322	557	236	226 to 246
35 to 44 years	102	369	325 to 413	318	260	249 to 271
45 to 64 years	82	398	369 to 427	293	265	251 to 279
45 to 54 years	60	418	384 to 452	193	270	253 to 287
55 to 64 years	23	353	313 to 393	100	257	234 to 280
Women 25 to 64	403	261	253 to 269	1,095	174	170 to 178
25 to 34 years	204	243	232 to 254	508	174	169 to 179
35 to 44 years	94	273	255 to 291	341	174	167 to 181
45 to 64 years	105	286	271 to 301	246	175	167 to 183
45 to 54 years	74	279	261 to 297	170	176	167 to 185
55 to 64 years	31	301	276 to 326	76	171	158 to 184
1989						
Men 25 to 64	631	544	523 to 565	1,795	353	344 to 362
25 to 34 years	259	479	462 to 496	815	315	307 to 323
35 to 44 years	214	583	560 to 606	553	379	365 to 393
45 to 64 years	159	667	621 to 713	427	408	393 to 423
45 to 54 years	115	636	556 to 716	294	409	391 to 427
55 to 64 years	44	707	636 to 778	133	408	378 to 438
Women 25 to 64	768	486	475 to 497	1,694	284	279 to 289
25 to 34 years	301	426	410 to 442	664	258	250 to 266
35 to 44 years	274	516	498 to 534	574	294	286 to 302
45 to 64 years	193	522	497 to 547	456	310	300 to 320
45 to 54 years	142	521	498 to 544	336	313	302 to 324
55 to 64 years	50	535	359 to 711	120	304	284 to 324

most part, on the future educational attainment of the black population.

College-educated blacks not only are more likely to have a job than blacks with a high school education, but also, among those employed full time, college graduates earn considerably more. In 1989, black male high school graduates ages 25 to 64 had median weekly earnings of $353 (plus or minus $9); college graduates earned about one-and-a-half (1.44 to 1.65) times that amount. The magnitude of this earnings gap was greater in 1989 than in 1979 (1.24 to 1.45 times), with men ages 25 to 34 accounting for most of the overall increase. Earnings differences also increased among black women, and, as with men, most of the widening occurred among younger women. These young workers are the age groups most affected by the labor market crowding that resulted from the increased supply of workers associated with the baby boom. In such a competitive environment, employers can raise their educational requirements for workers, giving college graduates even more of an advantage over those with only a high school education.[18] Table 6 shows data on the median weekly earnings of black college and high school graduates by their sex and age.

These earnings comparisons show that the gap between black college and high school graduates has increased in the 1980's. The data also suggest that, for both men and women, black college graduates' earnings increase more with age than do those of high school graduates. This can be seen in the data for black men who were ages 25 to 34 in 1979 and, thus, 35 to 44 in 1989. In 1979, the median weekly earnings of college graduates in this cohort were 1.16 to 1.42 times those of high school graduates, whereas in 1989, the median for college graduates was 1.43 to 1.66 times that of high school graduates.

Just as the higher starting pay of college graduates may reflect the value of additional years of schooling, larger pay increases once they are employed could reflect the differences in the amount of training college and high school graduates receive on the job. Job-related training, like formal education, is a human capital investment, and, according to a 1986 Rand Corporation study, college graduates are more likely than high school graduates to receive such training.[19] College graduates, then, have more opportunities to increase their productivity throughout their careers, and this may result in greater pay increases.

THE NOTION THAT a college education can contribute to closing the economic gap between blacks and whites appears to hold true for women. But the theory may be questioned in terms of men because substantial economic differences still exist between college-educated black and white men, and little progress toward narrowing the gap was made during the 1980's. Nevertheless, for all blacks, college education does provide considerable economic rewards above those generally received with only a high school education. □

Footnotes

ACKNOWLEDGEMENTS: The author thanks Bernard Altschuler, Patricia Merritt, and Ronald Richardson of the Data Development Staff, Office of Employment and Unemployment Statistics, for constructing the computer programs used for this study.

[1] Unless stated otherwise, all data in this article refer to persons 25 to 64 years old. This age group has been selected because it has the strongest attachment to the labor force. Many people under age 25 have not yet completed their formal education, and relatively few people over age 64 participate in the labor force.

[2] For a discussion of how human capital differences between blacks and whites relate to economic differences, see James P. Smith, "Race and Human Capital," *American Economic Review*, September 1984, pp. 685–98. For a general overview of human capital theory, see Gary S. Becker, *Human Capital* (New York, Columbia University Press, 1964 and 1975), or Jacob Mincer, *Schooling, Experience, and Earnings* (New York, Columbia University Press, 1974).

[3] See, for example, James P. Smith and Finis R. Welch, "Black Economic Progress After Myrdal," *Journal of Economic Literature*, June 1989, pp. 519–64.

[4] Current Population Survey data on educational attainment actually refer to years of school completed, rather than degrees obtained. In this article, those who attended college for 4 or more years are referred to as college graduates, and those who attended high school for 4 years are referred to as high school graduates. Available data suggest that blacks who report that they have completed 4 years of college are less likely than whites to have obtained a degree. Current plans are to change the information in the CPS from a "years of school completed" concept to a "degrees obtained" concept like that used in the 1990 census.

[5] Part of the difference in the CPS estimates of the number of black men and women ages 25 to 64 may result from differences in the coverage of these two groups in the 1980 decennial census. While evidence suggests that the 1980 census undercounted the number of black women in this age group, the undercount of black men is believed to have been much greater. CPS population estimates are based on decennial census figures, which are then adjusted over time for estimated births, deaths, and net immigration. A census undercount of the number of black men could result in the number of black male college graduates being underestimated in the CPS. For a more detailed discussion of the census undercount, see *Coverage of the National Population in the 1980 Census, by Age, Sex, and Race: Preliminary Estimates by Demographic Analysis, Current Population Report*, Series P-23, No. 115 (Bureau of the Census, 1982). Despite the fact that the CPS may understate the number of black male college graduates, administrative data from the U. S. Department of Education show that, in any given year, the number of black women receiving college degrees sub-

stantially exceeds the number of black men. See, for example, U. S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1989, vol. 2, Postsecondary Education*, p. 68.

[6] Curtis L. Gilroy, "Investment in human capital and black-white unemployment," *Monthly Labor Review*, July 1975, pp. 13–21.

[7] It is important to note that in 1988 the unemployment rate for college-educated black men (2.9 percent) was only about one-and-a-half times the rate for white men (1.7 percent). Because the rate for college-educated black men is so volatile from year to year, it is difficult to draw firm conclusions about changes in this group's unemployment situation.

[8] Because of the relatively small number of unemployed black college graduates in the CPS sample, it is not possible to analyze unemployment rates in different age groups. More reliable data would have allowed for the comparison of unemployment of younger graduates with that of graduates in older age groups.

[9] See Gary S. Becker, *Human Capital*, pp. 16–37. According to human capital theory, older workers generally earn more than younger workers because they are more experienced and thus more productive than younger workers. This human capital explanation has been disputed, however. Katharine G. Abraham and James L. Medoff, in *Length of Service and the Operation of Internal Labor Markets* (Cambridge, MA, National Bureau of Economic Research, Inc., 1983), working paper no. 1085, argue that the relatively higher pay of workers with more seniority "is to a significant extent a reward to seniority per se, rather than simply a reward for higher productivity."

[10] Annual earnings estimates are obtained from supplemental questions asked in the CPS in March of each year. All persons in the March CPS sample are asked if they worked at any time during the previous year. Those who worked are asked what they earned in that year. For example, all sample members in March 1980 who worked at any time during 1979 were asked their 1979 earnings. Estimates of usual weekly earnings are obtained by asking one-quarter of the wage and salary workers in each month's CPS sample their usual weekly hours and earnings. Annual average estimates of median weekly earnings are based on a sample size triple that used for the annual earnings estimates from the March supplement. The difference in sample sizes is shown by the following:

Sample size in March for annual earnings estimates = S
Sample size for annual averages of median usual weekly earnings = 12(1/4)(S) = 3S

A minor drawback to comparing weekly, rather than annual, earnings is that the universe for weekly earnings, unlike that for annual earnings, only includes wage and salary workers. Information on weekly earnings is not obtained for self-employed workers, such as business owners and some (though not all) doctors and lawyers. Although many self-employed workers are college graduates, they comprise only a small proportion of employed college graduates.

[11] The results of any survey, whether based on a sample or a complete census of the population, are subject to nonsampling, or response, variability. Nonsampling error can result from a number of causes, such as incorrect recording of the data, differences in the interpretation of questions, or respondents' inability or unwillingness to provide correct information. Because the estimates used in this article are based on one of many possible samples of the population, they are also subject to sampling error—variation which occurs by chance because a sample, rather than the entire population, is surveyed. The measure of this sampling variability is the standard error. The standard error and the sample estimate enable confidence intervals to be constructed. In this article, the 90-percent confidence interval—the sample estimate plus or minus 1.6 times the standard error—is the interval used to estimate median weekly earnings. For example, suppose that an estimate of median weekly earnings was $338 and the standard error for this median was $11; it can then be said with 90 percent confidence that the actual median is between $320 and $356 ($338 plus or minus 1.6 times $11). In other words, if 1,000 independent samples had been selected, the median would fall between $320 and $356 in 900 of those samples.

[12] The $544 median for black men is 76 percent of the $719 median for white men. The lower and upper boundaries of this ratio, 72 and 79 percent, respectively, are derived from the following tabulations:

$$\frac{\text{lower boundary of median for black men}}{\text{upper boundary of median for white men}} = \frac{\$523}{\$725} = 72 \text{ percent}$$

$$\frac{\text{upper boundary of median for black men}}{\text{lower boundary of median for white men}} = \frac{\$565}{\$713} = 79 \text{ percent}$$

[13] It is possible that the occupational differences between black and white college-educated men vary by age. For example, the occupational employment characteristics of young blacks may be similar to those of young whites, while the differences between older blacks and whites may be sizable. This hypothesis cannot be tested accurately, however, because the CPS sample is not sufficiently large to provide reliable occupational employment estimates for black male college graduates in specific age groups.

[14] The number of workers with more than 4 years of college can be used as a rough approximation of workers with graduate schooling. Among college-educated men employed as full-time wage and salary workers in 1989, a larger proportion of whites (44 percent) than blacks (34 percent) had completed more than 4 years of college. To account for this difference, median earnings were also tabulated for workers with exactly 4 years of college. The black-white earnings gap for this group was no different from that for men with 4 years of college.

[15] Wayne J. Howe, "Education and demographics: how do they affect unemployment rates?" *Monthly Labor Review*, January 1988, pp. 3–9.

[16] *Ibid.*

[17] George Silvestri and John Lukasiewicz, "Projections of occupational employment, 1988–2000," *Monthly Labor Review*, November 1989, pp. 42–65.

[18] Howe, "Education and demographics."

[19] L. A. Lillard and H. W. Tan, *Private Sector Training: Who Gets It and What are Its Effects?* (Santa Monica, CA, Rand Corporation, 1986), p. 27.