Reconciling conflicting data on jobs for college graduates

If, as some analysts contend, the rising relative wages of college graduates in the 1980's suggest a shortage of these workers, why did one-fifth of them accept jobs that traditionally do not require a degree for entry?

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Since the early 1970's, the data suggest a growing proportion of college graduates are in jobs that usually do not require at least a bachelor's degree. Bureau of Labor Statistics analysis of data related to the employment of college graduates indicates that there are more jobseekers with college degrees than there are openings in jobs requiring a degree.[1] News reports and surveys by government agencies and private organizations on the employment patterns of recent college graduates support this conclusion. BLS projects that this divergence will continue through 2005.[2]

In contrast to this apparent mismatch of jobs and jobseekers, articles in research and popular journals in recent years have pointed out that since 1979, earnings of college graduates have increased sharply relative to earnings of high school graduates. Some analysts have interpreted this to mean that employers were forced to bid up the wages of college graduates in order to fill vacant jobs—an action likely to occur only when there is a shortage of graduates.

Analysis of earnings data by educational level clearly confirm a sharp rise in earnings for college graduates relative to those of high school graduates during the 1980's. However, this article concludes that the relative earnings increase for college graduates was the result of a worsening job market for male high school graduates, not because of a shortage of workers with college degrees.

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Identifying 'college-level' jobs

It is not possible to precisely identify and measure the number of jobs that *require* a college degree. Standards of which jobs require a degree differ among employers, and ideas of what constitutes a "college-level" job also differ among employers, employees, and others. More important, occupational classification systems do not neatly distinguish between jobs that require a college degree and other jobs. However, surveys that asked workers what level of education they needed to qualify for their current jobs[3] indicate that most jobs in retail sales; administrative support, including clerical; service; farm; precision production, craft, and repair; and operator, fabricator, and laborer occupational groups do not require a degree for entry, nor do they offer job duties attractive to most graduates. In contrast, the surveys show that most jobs in managerial, professional specialty, sales representative, and many technician occupations require a degree. These jobs involve specific skills (for example, the skills necessary to perform engineering and accounting tasks) or, at least, general analytic and communications skills typically learned in college. More important, employers generally recruit or, at a minimum, apparently prefer college graduates for these occupations. Some exceptions are jobs such as managers of small retail, repair, construction, or cleaning service establishments, construction inspectors, or photographers—occupations for which on-the-job training

or 1 or 2 years of education in a technical school or college is generally considered adequate preparation. Employers often seek college graduates for some jobs within occupations that generally do not require a degree. For example, employers may require some insurance adjusters and investigators (from the administrative support occupational group), craftworker supervisors (from the precision production, craft, and repair group), police officers (service occupational group), and farm managers (farm group) to have a degree. Still, other occupations fall in a "gray area"—occupations within the professional, managerial, sales representative, and technician occupational groups, including professional athletes, musicians, construction managers, and manufacturers' sales representatives—and traditionally have been filled by both graduates and nongraduates.

Taking these exceptions into account to identify jobs that do not require a degree would entail numerous arbitrary judgments. Therefore, for the purpose of this analysis, the "educationally underutilized" (college graduates who are employed in occupations that do not require a college degree) are defined as those working in occupations within retail sales; administrative support; service; precision production, craft, and repair; operator, fabricator, and laborer; and farm jobs, except those noted above. The analysis in this article does not consider as educationally underutilized college graduates who are in managerial, professional specialty, sales representative, or technician occupations, nor most who are police officers, blue-collar worker supervisors, farm managers, or senior-level administrative support workers.

What the data show

The 1960's. During the 1960's, employers heavily recruited college graduates. Few graduates, regardless of their field of study, had difficulty finding college-level managerial, professional specialty, technical, and sales representative jobs. According to analyst Richard Freeman, "jobs sought graduates."[4]

After 1969, the job situation changed significantly for college graduates. Data from the Current Population Survey (CPS)[5] showed a sharply rising proportion of graduates in jobs that traditionally had not required a college degree—retail

Table 1. **Occupation of college graduates in jobs that do not require a degree for entry**

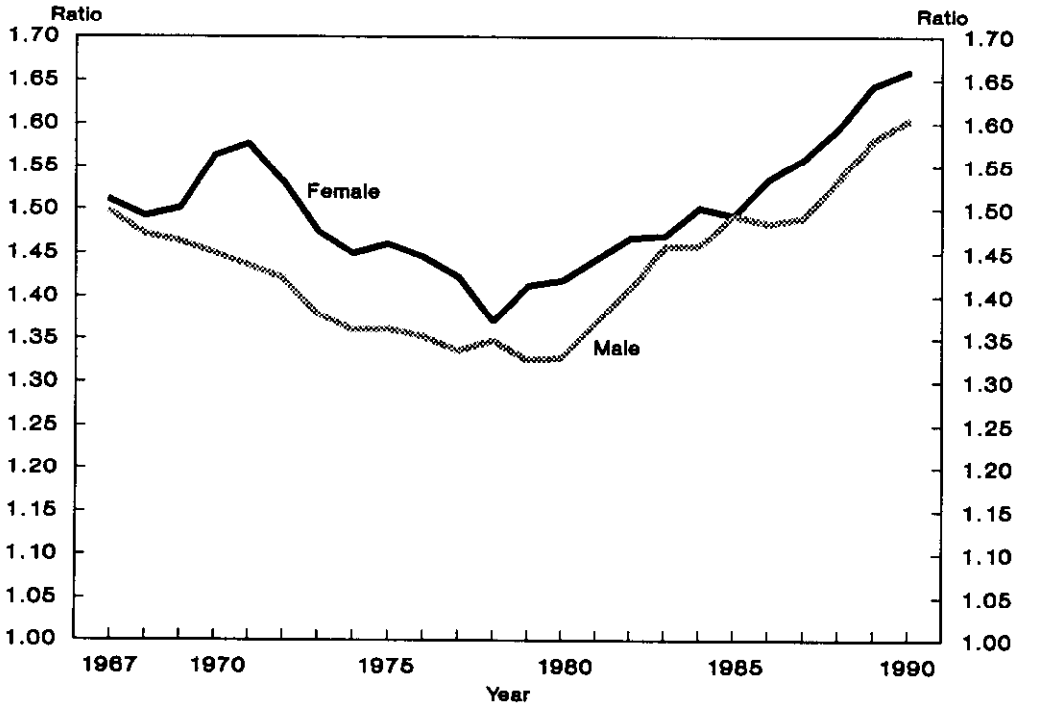
[In thousands]

Year	All graduates in the labor force	Graduates in jobs that require a degree	Graduates in jobs that do not require a degree or are unemployed									
			Number	Percent	Sales			Administrative support, including clerical	Blue collar[1]	Service	Farm	Unemployed
					Total	Retail	Supervisor					
1967	8,792	7,760	1,032	11.7	155	95	60	364	275	111	48	79
1968	9,328	8,341	987	10.6	135	80	55	377	238	97	45	95
1969	9,676	8,644	1,032	10.7	149	89	60	373	269	105	46	90
1970	10,157	9,006	1,151	11.3	185	115	70	408	272	100	33	151
1971	10,859	9,484	1,375	12.7	200	125	75	414	313	157	40	251
1972	11,604	9,936	1,668	14.4	214	134	80	524	376	211	53	290
1973	12,368	10,575	1,793	14.5	248	158	90	509	457	242	81	256
1974	13,428	11,358	2,070	15.4	265	165	100	628	539	282	94	262
1975	14,328	11,930	2,398	16.7	307	182	125	733	567	286	89	416
1976	15,356	12,642	2,714	17.7	332	207	125	834	647	378	94	429
1977	16,200	13,190	3,010	18.6	391	241	150	860	710	409	104	536
1978	16,701	13,808	2,893	17.3	406	231	175	888	704	378	102	415
1979	17,925	14,762	3,163	17.6	437	237	200	976	785	449	112	404
1980	19,237	15,652	3,585	18.6	491	266	225	1,099	910	567	117	401
1981	19,759	16,044	3,715	18.8	524	274	250	1,115	920	553	124	479
1982	20,958	16,829	4,129	19.7	586	311	275	1,088	985	677	115	679
1983	22,479	17,831	4,648	20.7	849	502	347	1,129	941	719	167	843
1984	23,357	18,904	4,453	19.1	809	421	388	1,170	993	670	165	646
1985	24,137	19,492	4,645	19.2	815	428	387	1,297	1,022	706	180	625
1986	24,686	19,894	4,792	19.4	888	473	415	1,341	1,124	686	146	607
1987	25,765	20,736	5,029	19.5	933	542	391	1,324	1,191	793	132	656
1988	27,135	21,848	5,287	19.5	1,021	568	453	1,444	1,296	831	172	523
1989	28,080	22,727	5,353	19.1	1,076	590	486	1,496	1,363	834	171	413
1990	28,983	23,230	5,753	19.9	1,146	644	502	1,533	1,306	889	190	688

[1] Includes precision production, craft, and repair; and operators, fabricators, and laborers.

SOURCE: Current Population Survey.

Chart 1. **Earnings premiums of college graduates compared with high school graduates, 1967-90**



NOTE: Data are for year-round, full-time workers, age 25 or older.

sales, administrative support (including clerical); service work; precision production, craft, and repair jobs; operator, fabricator, and laborer jobs; and farm jobs.

Of course, some college graduates have always held jobs in these categories while attending graduate school or tending to family responsibilities, or just because they preferred the work. In addition, reports during this period indicated that on-campus recruiting by employers became more limited after 1969, and the news media often carried reports of college graduates driving cabs and waiting tables.

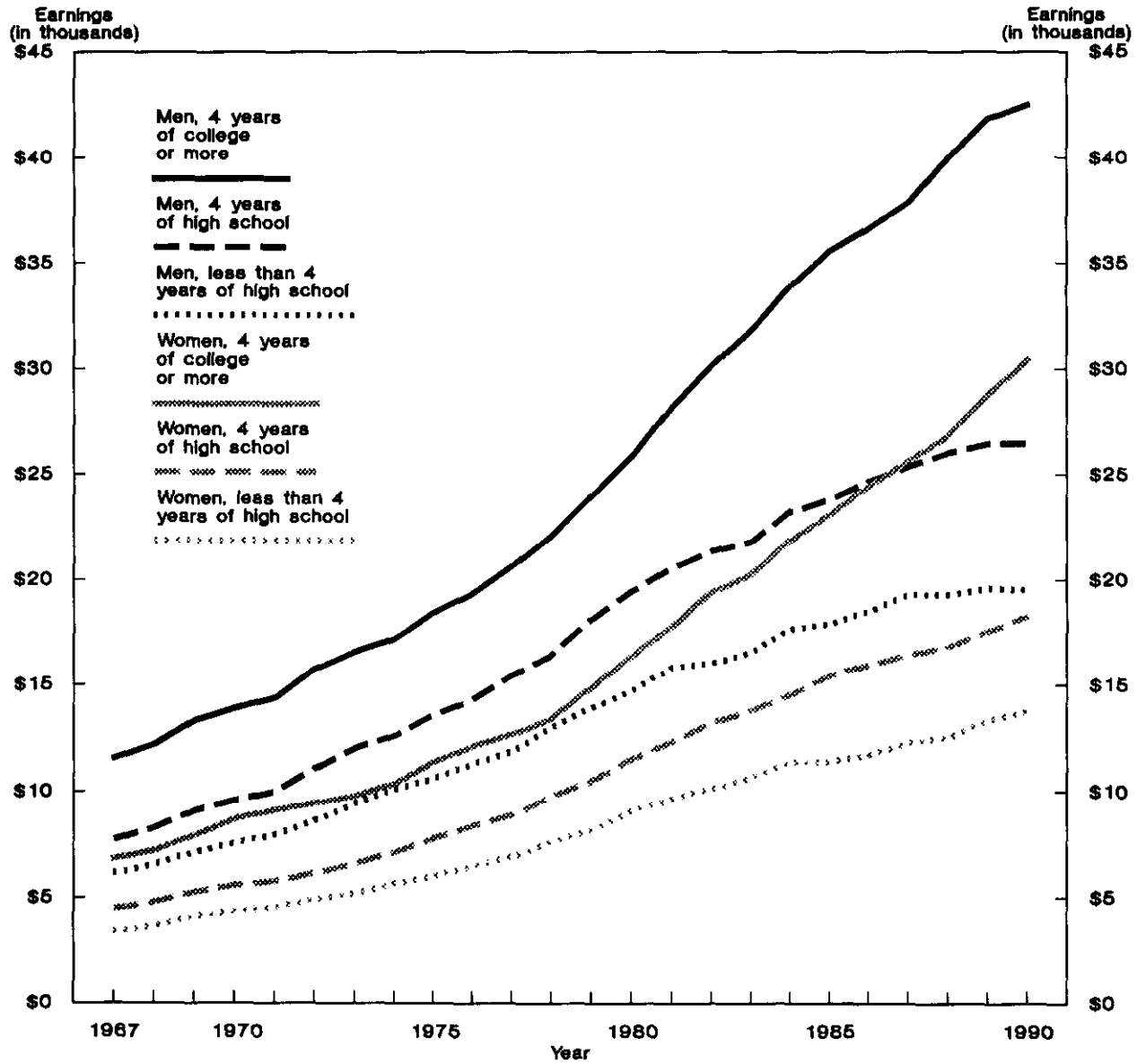
Yet, the conclusion, based on these reports, that college graduates faced job market difficulties is open to questions. For example, some jobs in administrative support (including clerical); service; precision production, craft, and repair; and farming occupations *require* a college degree. Also, CPS data used in this analysis cover workers who completed 4 or more years of college, not necessarily those with at least a bachelor's degree. Therefore, some of the increase in the number of *college graduates* in jobs that traditionally did not require a degree may include some who did not obtain a degree despite their completion of 4 years or more of college.[6] (In this analysis, the term "college graduates" and "those with 4 or more years of college" are used interchangeably.)

What is the reason for the sharp rise in the number and proportion of workers with 4 or more years of college employed in occupations for which college graduates were not sought or to which such graduates were not attracted? One logical explanation is that not enough traditionally college-level jobs were available for all graduates seeking such positions.

The 1970's. Even with the narrow definition of educationally underutilized employees, the number of underutilized college graduates increased from an estimated 1.0 million in 1969 to 3.6 million in 1980, or from about 1 of 10 graduates in the labor force to almost 1 of 5. (See table 1.) The flow of graduates into jobs that do not traditionally require a degree largely resulted from a doubling in the number of college graduates in the labor force, coupled with slower employment growth during the 1970's than during the 1960's for school teachers—the largest occupation for college graduates—and in research and development, a very large employer of science and engineering graduates.

The poor job market for college graduates in the 1970's was reflected in their earnings. CPS data show that earnings increased slower for both males and females with 4 or more years of college than for males and females with 4 years of high school. The

Chart 2. Annual earnings, by years of education and by sex, 1967–90



NOTE: Data are for year-round, full-time workers, age 25 or older.

latter group is the largest educational group in the labor force, representing about 40 percent of all workers. During the 1969–80 period, earnings for high school graduates increased 119 percent for females and 114 percent for males. For college graduates, earnings increased 106 percent for females and 94 percent for males. Consequently, earnings premiums paid to female and male college graduates declined relative to the earnings of female and male high school graduates. (See chart 1.)

The very large increase in the number of graduates during the 1970's, combined with a slower growth of jobs in occupations that required a college degree, enabled employers to fill college-level job openings, even though wage increases for college graduates were lower than those for employees who had less education. Because college graduates were relatively less expensive to hire, employers might be expected to hire more of them. In fact, employers hired nearly all graduates who sought jobs, but many more than in the past were hired for retail sales, administrative support, and similar jobs that paid lower wages than the traditional college-level occupations.

The 1980's. From 1980 to 1990, the proportion of college graduates in the labor force who were either educationally underutilized or unemployed remained at about one-fifth of all graduates in the labor force, although their numbers rose from 3.6 million to 5.8 million. (See table 1.) This implies that, as in the 1970's, the number of graduates in the labor force continued to exceed the number of college-level job openings.

Other data sources also suggest that there were more college graduates than there were openings in college-level jobs during the 1980's. The Recent College Graduates Surveys conducted by the National Center for Education Statistics indicate that almost 40 percent of the graduates awarded bachelor's degrees in 1984 and 1986 reported *that they thought* a degree was not needed to obtain the job they held a year after graduation.[7] It is unlikely that this proportion of graduates would be in jobs that did not require a degree if employers were having difficulty finding graduates to fill college-level jobs. Surveys of graduates in 1977, 1980, 1984, and 1986[8] also reported occupational outcomes similar to those concluded from the CPS data—more than a quarter of graduates with bachelor's degrees were in retail sales, administrative support, service, and blue-collar jobs or were unemployed the year after graduation. Data on on-campus recruiting provide further evidence that a significant portion of new college graduates entered jobs that did not require a college degree.[9]

However, during this period, the earnings of college graduates rose sharply relative to earnings of high school graduates, with greater increases for college men than for college women. By 1988, male college graduates had recovered the earnings premium they had held in 1967 relative to male high school graduates. (See chart 1.) As noted earlier, some analysts interpreted the sharp relative rise in earnings for college graduates to mean that employers competed for an insufficient number of college graduates. However, a review of the occupational employment patterns of college graduates leads to the opposite conclusion that an oversupply of college graduates existed because of the rising numbers of educationally underutilized and unemployed graduates.

Reconciling contradictory data

In recent years, a number of analysts have addressed issues concerning supply-demand conditions for college graduates and the rise in their relative earnings.[10] In 1989, Kevin Murphy and Finis Welch concluded that the demand for college graduates must have grown extremely rapidly since 1979.[11] In 1991, John Bishop and Shani Carter contended that demand for college graduates grew extremely rapidly during the 1980's—more rapidly than supply. This created a shortage of college graduates, and graduates' wages were bid up as employers sought to hire them. Bishop and Carter also contended that the occupational projections to the year 1990 BLS prepared in 1980 were wrong, and that the market could have absorbed substantially more graduates in college-level jobs if more graduates had been available.[12]

Can this seemingly contradictory evidence—the increase of college graduates in jobs that do not require a college degree, and higher relative wages for college graduates—be reconciled? First, it is important to know whether demand for workers with 4 or more years of college really grew faster than supply, because this is a widely used definition of a shortage. In their study of the market for scientists and engineers, David Blank and George Stigler explain that ". . . a shortage exists when the number of workers available (the supply) increases less rapidly than the number demanded *at the salaries paid in the recent past.* Then salaries will rise. . . ."[13] A review of employment data indicates that demand did not grow faster than supply over the 1979–90 period. In fact, during that period, supply, as measured by the number of college graduates in the labor force, grew from 17.9 million to 29 million, or 62 percent. (See table 1.) At the same time, demand, as measured by employment of college graduates in managerial, professional specialty, technical, sales representative, and certain senior administrative support, police, blue-collar worker supervisor, and farm manager jobs that generally require a degree, increased 57 percent, or about as much as the supply of graduates. The number of college graduates who were in jobs that did not require a degree or who were unemployed increased more rapidly—81 percent. These data indicate that employers satisfied their demand for college graduates. If they did not, why did they not hire more

Table 2. **Percent increase in earnings, by level of education, 1979–90**

Level of education	Percent increase
All workers, 25 years and older	67
Females:	
4 years or more of college	104
4 years of high school	74
Fewer than 4 years of high school	68
Males:	
4 years or more of college	77
4 years of high school	46
Fewer than 4 years of high school	40

NOTE: Data are for median annual income of full-time workers.

SOURCE: *Money Income of Households, Families, and Persons in the United States,* Current Population Reports, Series P-60 (Bureau of the Census), various years.

unemployed or underemployed graduates to fill jobs requiring a degree? Is it possible that employers raised their hiring standards, and these graduates did not meet those standards? And, if employers fully satisfied their demand for workers, there should not be the bidding up of wages that Blank and Stigler describe.

Possible explanations. Poor educational preparation of college graduates for the work force could mean that many graduates did not qualify for available college-level jobs. And it is possible that many high school graduates were not educationally prepared for work, forcing employers to hire college graduates to fill jobs formerly filled by high school graduates.

However, available data do not support assertions that educational preparation has declined. In fact, data from the National Assessment of Educational Progress show modest increases in the reading and mathematics proficiency of 17-year-olds since the early 1970's. Data on SAT scores of high school graduates who plan to attend college showed modest decreases during the 1970's, and some recovery during the 1980's. The Graduate Record Examination, taken by bachelor's degree graduates planning to apply to graduate school, is the best broad-based measure of graduates' general learned abilities, but may not be applicable to those not planning graduate study. For this exam, scores dropped during the 1965–79 period, but by 1989, had regained their 1969 level.[14] Now, of course, employers' educational needs may be rising, so that, relatively, scores are falling. Even so, it is not clear why employers would place so many of these admittedly less-qualified college graduates in jobs that do not require college-level skills if they had vacant college-level jobs. A logical explanation could be that the abilities of these graduates fell so far short of employers' needs that it was not reasonable to hire and train these workers, even at wages well below those paid to other graduates. However, we do not have evidence to this effect.

Also, many of the jobs filled by college graduates during the 1980's required so few academic skills that most high school graduates could have performed them adequately. For example, from 1983 to 1990, the number of college graduates working as street vendors and door-to-door salesworkers increased from 57,000 to 75,000; those working as maids, housemen, janitors, and cleaners increased from 72,000 to 83,000; machine operators, except precision, increased from 127,000 to 154,000; and motor vehicle operators (mostly truck and bus drivers), from 99,000 to 166,000.

A mismatch of skills, that is, too few graduates in some fields of training and too many in others could have caused the observed increase in wages. However, the number of college graduates in non-college-level occupations is so large, it is unlikely that this mismatch factor alone could be the sole reason. As indicated above, the number of college graduates employed in jobs that do not require a degree or who were unemployed increased from 3.2 million in 1979 to 5.8 million in 1990.

Occupational classification problems could have contributed to an incorrect picture of the employment patterns of college graduates through the 1980's. Researchers in the past have noted problems in the CPS, but there are reasons to doubt that data problems are a factor. First, the *proportion* of graduates in occupational groups that do not generally require a degree has grown steadily each year. (See table 1.) These year-to-year changes seem a more reasonable conclusion from the CPS data than do year-to-year increases in misclassifications of respondents. Second, the earnings reported by graduates who are in occupations that do not require a degree are lower than those for graduates in college-level jobs, suggesting that few workers were misclassified. For example, in 1990, the median earnings reported by the 300,000 workers with 4 years of college employed full-

Table 3. **Labor force, by level of education, 1969, 1979, and 1990**

[Numbers in thousands]

Level of education	1969		1979		1990		Percent change, 1979–90
	Number	Percent	Number	Percent	Number	Percent	
Total labor force	76,750	100.0	101,579	100.0	124,806	100.0	22.9
4 years or more of college	9,676	12.6	17,924	17.6	28,982	23.2	61.7
1 to 3 years of college	9,638	12.6	17,815	17.5	26,553	21.3	49.0
High school or less education	57,436	74.8	65,840	64.8	69,271	55.5	5.2
4 years of high school	29,478	38.4	40,644	40.0	49,139	39.4	20.9
Less than 4 years of high school	27,958	36.4	25,196	24.8	20,132	16.1	–20.1

Note: Percents may not add to 100 due to rounding.

SOURCE: Current Population Survey.

time in retail sales were $361 a week, and earnings for the 1,490,000 such workers in administrative support, which clearly included some in college level jobs, were $401.[15] In comparison, those with 4 years of college who were in executive, administrative, and managerial jobs had median weekly earnings of $675, and those in professional specialty occupations, $595.

Earnings divergence

Data on employment patterns appear to be incongruent with data showing that the earnings of college graduates rose sharply relative to high school graduates during the 1980's. Rising relative wages usually are a very good indicator of employee shortages, because employers tend to offer higher wages only to workers who are in short supply. However, for changes in relative wages to be useful in identifying shortages, the base against which the group under study is measured must itself provide some constancy.[16] Otherwise, declines or increases in earnings can generate relative earnings changes between the base and the group studied—even though there is no bidding up or down of wages in the group being studied.

An examination of actual earnings growth from 1979 to 1990 by educational attainment and gender show that earnings of female college graduates increased the fastest, followed by male college graduates, then female high school graduates. (See table 2.) Earnings of male high school graduates increased much more slowly over the period. The premium for male college graduates over male high school graduates increased significantly over the 1979–90 period. (See charts 1 and 2.)

Other researchers also observed the relatively slow earnings growth for males with a high school education. For example, McKinley L. Blackburn, David E. Bloom, and Richard B. Freeman concluded, "For some—mostly young, less educated, and blue collar men—the 1980's job market was a disaster."[17] They calculated that the real wages for these men fell substantially. And, Lawrence Mishel and Ruy A. Teixeira concluded that "the relative return to education increased in the 1980's primarily because of declines in (real) wages of the less educated, not because of increasing (real) wages for the more educated."[18]

Changes in earnings of male high school graduates relative to other groups over the 1979–90 period also are revealing. In 1979, male high school graduates earned 22 percent more than female college graduates; by 1990, they earned 13 percent less. In 1979, the premium for male high school graduates over female high school graduates was 72 percent; by 1990, it had fallen to 45 percent. In other words, wages of female high school graduates rose sharply compared with those of male high school graduates, just, as noted above, did the wages increase for male college graduates. If rising wages for male college graduates relative to male high school graduates are simply interpreted as evidence of a shortage of male college graduates, why are rising wages of female high school graduates relative to male high school graduates not viewed as evidence of a shortage of female high school graduates? From

Table 4. **Percent increase in earnings of full-time wage and salary workers by level of education, selected occupations, 1983–90**

Occupation	4 years of high school	1 to 3 years of college	4 years or more of college
Total	26	34	37
Executive, administrative, and managerial occupations	28	34	39
Accountants and auditors	25	29	33
Professional specialty occupations	24	37	44
Engineers	40	43	36
Registered nurses	53	49	56
Writers, artists, entertainers, and athletes	29	20	37
Technicians	31	41	47
Health technologists and technicians	29	39	43
Engineering technologists and technicians	25	34	34
Sales occupations	21	33	43
Supervisors and proprietors	21	25	41
Sales representatives, financial and business services	23	31	32
Sales representatives, mining, manufacturing, and wholesale	31	30	50
Salesworkers, retail and personal services	33	31	50
Administrative support occupations, including clerical	30	37	34
Supervisors	33	42	33
Secretaries	35	41	30
Bookkeepers, accounting, and auditing clerks	33	38	46
Adjusters and investigators	34	31	29
Service occupations, except private household	30	36	45
Police and detectives, except supervisors	29	31	50
Food preparation and service occupations	37	50	66
Precision production, craft and repair occupations	22	35	33
Mechanics and repairers	21	35	42
Construction trades	26	40	17
Precision production occupations	21	26	30
Machine operators, assemblers, and inspectors	26	31	25
Transportation and material moving occupations	21	23	34

NOTE: Data for 1983 are used as the base because this is the earliest year for which consistent occupational data are available. Only occupations with at least 100,000 employment at each educational level in 1983 and 1990 are included.

SOURCE: Current Population Survey.

Table 5. **Proportion of high earners, by level of education, full-time wage and salary workers, 1979 and 1990**

[Numbers in thousands]

Level of education	1979		1990	
	Number	Percent	Number	Percent
Top 20 percent of earners				
Total	14,220	100.0	17,008	100.0
Less than 4 years of high school	1,580	11.1	607	3.6
4 years of high school	4,476	31.5	3,583	21.1
1 to 3 years of college	2,698	19.0	3,521	20.7
4 years or more of college	5,466	38.4	9,297	54.6
Top 10 percent of earners				
Total	7,094	100.0	8,500	100.0
Less than 4 years of high school	599	8.4	201	2.4
4 years of high school	1,826	25.7	1,286	15.1
1 to 3 years of college	1,305	18.4	1,557	18.3
4 years or more of college	3,364	47.4	5,456	64.2

NOTE: Percents may not add to 100 due to rounding.

SOURCE: Current Population Survey.

Table 6. **Usual weekly earnings of full-time wage and salary workers, 25 years of age and older, by level of education, 1990**

Years of school completed	Percent with usual weekly earnings					Median weekly earnings
	Total	Under $250	$250-$499	$500-$999	More than $1,000	
4 years of high school	100	18	51	29	3	$386
1-3 years of college	100	9	44	40	6	476
4 years of college	100	4	30	51	16	595
5 or more years of college	100	3	17	52	28	726

NOTE: Percents may not add to 100 due to rounding.

SOURCE: Current Population Survey.

1979 to 1990, earnings increased slower for men with fewer than 4 years of high school than for any other demographic group. Consequently, wages increased for all other worker groups relative to males with fewer than 4 years of high school. Using as a base, men with fewer than 4 years of high school, should the case be made that there was a shortage of all other occupational groups, including male high school graduates?

These data suggest that the declining relative earnings of high school graduates (or those with less education) are not an appropriate standard for determining whether there was a shortage of college graduates.

Why did earnings increase so slowly for those with a high school diploma or less education? From 1979 to 1990, the supply of workers in the labor force with 4 years of high school education or less increased 5 percent. (See table 3.) Over the same period, the number of jobs in occupations that generally do not require a college degree increased 8 percent.[19] There is little evidence that the wages of workers with less education were bid down because the number of jobs for which they qualify increased slower than supply.

Research by a number of analysts conclude that a radical restructuring of the U.S. economy occurred during the 1980's.[20] Many high-wage jobs which required a high school diploma or less education disappeared, or were taken by those with more education. Employment peaked in manufacturing in 1979 and in mining in 1981. The number of production-worker jobs in mining and manufacturing—industries which traditionally have provided high-earning jobs for those without a college education (particularly men)—declined by 2.3 million between 1979 and 1990. This represented a decline from 17.6 percent to 12.3 percent of all jobs in nonfarm establishments.[21] Because a large proportion of these jobs had been held by men, their earnings growth slowed much more than that for women over the period.

Over the 1979–90 period, employment growth was above average in retail trade; finance, insurance, and real estate; and in business, professional, and health services. These industries provide many jobs for workers who are high school graduates, but most often the pay is less than that offered for jobs in manufacturing and mining occupations. Because female high school graduates were much more likely than male high school graduates to be employed in one of these industries than in a high-wage manufacturing or mining job, their earnings growth held up better than that of the males.

In addition, workers with at least some college education apparently took a growing proportion of the better paying jobs. College graduates and those with 1 to 3 years of college had higher increases in earnings in every occupational group and in almost every individual occupation than did high school graduates. (See table 4.) For example, between 1983 and 1990, among mechanics and repairers, earnings increased 42 percent for those with 4 or more years of college, 35 percent for those with 1 to 3 years of college, and 21 percent for those with 4 years of high school.

The effect of all these factors can be seen in table 5. In 1979, 32 percent of all high-paid workers (those in the top one-fifth of all earners) were high school graduates. By 1990, only 21 percent were in the top one-fifth. High school graduates as a percent of employment declined by less than 1 percentage point over the period. (See table 3.) The trend is similar for the top one-tenth of earners, which excludes most high-paid production workers.

Could more college graduates have been absorbed in college-level jobs during the 1980's? We have noted that employers chose not to hire large numbers of available college graduates for college-level jobs, even though the graduates were willing to work at wages well below the going rate for those jobs. This suggests that a relatively inelastic demand curve existed for college-level skills, and that the market's ability to absorb more of these graduates was limited. But could the market have absorbed more of the graduates if they had degrees in sought-after fields such as engineering and nursing, or if they had achieved higher grades in school or otherwise demonstrated that they were better qualified? In nursing and a few other health fields, there is clear evidence that jobs were unfilled, so more graduates probably could have been hired. However, for other fields, research revealed little evidence that employers wanted to hire more graduates at current wages than they actually hired.[22]

Conclusions and implications

The foregoing discussion indicates that during the 1980's, the earnings of college graduates increased relative to those with less education; an increasing number of college graduates were employed in jobs that did not usually require a degree; and employers had little difficulty hiring a sufficient number of college graduates to fill jobs that required a college degree. Analysts can reasonably conclude from the data presented in this article that rising relative wages of college graduates were not the result of a general shortage of college graduates, but rather a result of a restructuring of the economy. This restructuring affected particularly the earnings of high school graduates who in the past often found work in higher paying manufacturing and mining occupations.

Despite the large number of workers with 4 years of college education who were employed in jobs that did not require a degree, the data clearly show that college graduates were paid a premium for their skills and abilities, regardless of the occupation in which they are employed. Thus, on average, one can conclude that during the 1980's, a college degree did pay off for the great majority of workers. Some college graduates, however, earned substantially less than the average. (See table 6.)

If the number of college graduates had been even higher during the 1980's, would the added graduates (that is, the marginal increment) have had earnings that followed the average distribution, or would they more likely have been at the lower end of the earnings spectrum? This article presented little evidence that there were many unfilled college-level jobs. Therefore, it is likely that many graduates with marginal skills would have been employed in jobs that do not require a degree. If so, these workers could well have ended up at the low end of the earnings scale. However, if the data on the rising relative earnings of college graduates are assumed to reflect a shortage, as noted by Bishop and Carter, who stated, "The first eight years of the 1980's were clearly a period of a growing shortage of college graduates,"[23] then we could conclude that, at worst, the graduates added to the margin would follow the average distribution. Bishop and Carter argue that "education is a public function, and a public policy response to the shortage appears to be in order. Cost-effective ways of stimulating a substantial increase in the supply of college graduates are needed."[24] This does not appear to be consistent with our analysis of the supply of, and the demand for, college graduates in the 1980's, nor is it consistent with Kristina Shelley's analysis on the projected outlook for college graduates.[25] She projects that there will continue to be more graduates entering the labor force through 2005 than there will be openings for jobs that require a college degree, even under very optimistic assumptions about employment growth and upgraded job requirements.

If the past is a prelude to the future, a careful study of past trends in the job market of college graduates is needed to determine future policy relating to these workers. □

Footnotes

[1] See Jon Sargent and Janet Pfleeger, "The Job Outlook for College Graduates to the Year 2000," *Occupational Outlook Quarterly*, Summer 1990. Previous analyses of the outlook for college graduates were published in the Winter 1979 and Summer 1982, 1984, 1986, and 1988 issues of the *Quarterly*.

[2] See Kristina J. Shelley, "The future of jobs for college graduates," page 13, this issue.

[3] See *How Workers Get Their Training*, Bulletin 2226 (Bureau of Labor Statistics, 1985). BLS also conducts such research in relation to preparation of the *Occupational Outlook Handbook*, which is published every two years. The most recent issue was published in 1992.

[4] Richard Freeman, *The Overeducated American* (New York, Academic Press, Inc., 1976), p. 16. See also footnote 9.

[5] The Current Population Survey is a monthly survey of 60,000 households, conducted by the Bureau of the Census for the Bureau of Labor Statistics.

[6] Because the CPS does not specify the awarding of a college degree or a high school diploma, in this analysis, completion of 4 years of college is considered equivalent to a bachelor's degree and completion of 4 years of high school is considered equivalent to a high school diploma. While clearly the levels would be affected by having degree data,

the trends are unlikely to be affected in any appreciable way.

[7] Thomas Amirault, "Labor Market Trends for New College Graduates," *Occupational Outlook Quarterly*, Fall 1990, table 7.

[8] Amirault, "Labor Market Trends," table 5.

[9] A survey of 1989–90 graduates found that even though 60 percent of the seniors at liberal arts colleges used the placement office, only 27 percent found jobs through the office, and only 9 percent were hired through on-campus interviews. See *College Recruiting and Relations Survey, 1990* (Bethlehem, PA, College Placement Council, Inc.). In contrast are conditions described by Edward T. O'Donnell, former assistant director of the Bureau's Boston regional office, in an article "Everything's Go for the College Grads," *Occupational Outlook Quarterly*, May 1967. The article was based on interviews in early 1967 with directors of college placement offices, employment recruiters, and students throughout New England. O'Donnell noted, "Marvelling at the number and diversity of jobs being offered, one placement director at a major university said, 'some firms almost seem to be pressing the panic button.' Challenging jobs are available . . . even for humanities majors. When the college's physical facilities cannot accommodate all interviewers desiring to make campus visits, firms are encouraged to provide written job descriptions . . . supply-demand relationships seem to be well understood by recruiters, most of whom are reconciled to the futility of requesting interviews only with students in the upper portion of their class."

[10] Marvin H. Kosters, "Be Cool, Stay in School," *The American Enterprise*, March/April 1990, and "School, Work Experience, and Wage Trends," *American Economic Association Papers and Proceedings, May 1990*; John Bound and George Johnson, "Changes in the Structure of Wages During the 1980's: An Evaluation of Alternative Explanations," *The American Economic Review*, June 1992; Ramon Viliches, "Changes in the Structure of Wages: A Regional Comparison," *New England Economic Review*, July/August 1991; and Chinhui Juhn, Kevin Murphy, and Brooks Pierce, "Wage Inequality and the Rise in Returns to Skill," October 1989 (unpublished paper).

[11] Kevin Murphy and Finis Welch, "Wage Premiums for College Graduates, Recent Growth and Possible Explanations," *Educational Researcher*, May 1989.

[12] John Bishop and Shani Carter, "The Worsening Shortage of College Graduates," *Educational Research and Policy Analysis*, Fall 1991.

[13] David A. Blank and George J. Stigler, *The Demand and Supply of Scientific Personnel* (Cambridge, MA, National Bureau of Economic Research, Inc., 1957), pp. 23–24.

[14] *The Condition of Education, 1992* (U.S. Department of Education, National Center for Education Statistics, 1992).

[15] Based on tabulations of CPS data.

[16] This problem has been noted by other researchers. For example, see Glen G. Cain, Richard B. Freeman, and W. Lee Hansen, *Labor Market Analysis of Engineers and Technical Workers* (Baltimore, MD, The Johns Hopkins University Press, 1973), p. 63. The authors note that "In all this work, a perennial problem is determining the alternative occupations which provide a basis of comparison for the wage and salary movements."

[17] McKinley L. Blackburn, David E. Bloom, and Richard B. Freeman, "An Era of Falling Earnings and Rising Inequality?" *Brookings Review*, Winter 1990/91, and "The Declining Economic Position of Less Skilled American Men," in Gary Burtless, ed., *A Future of Lousy Jobs? The Changing Structure of U.S. Wages* (Washington, The Brookings Institution, 1990).

[18] Lawrence Mishel and Ruy A. Teixeira, *The Myth of the Coming Labor Shortage; Job Skills and Incomes of America's Workforce 2000* (Washington, Economic Policy Institute, 1991).

[19] The number increased from 64,259,000 to 69,224,000. It includes all employment in administrative support (including clerical); service; precision production, craft, and repair; operators, fabricators, and laborers; and farming, forestry and fishing occupations. Data for 1979 are from Deborah Pisetzner Klein, "Occupational Employment Statistics for 1972-82," *Employment and Earnings*, January 1984; 1990 data are from *Employment and Earnings*, January 1991.

[20] See footnotes 10, 17, and 18.

[21] Several hundred thousand jobs also were lost in railroads and telephone communications, two other high-wage industries for those without a 4-year college degree, and employment of construction workers in the construction industry declined in relative terms from 4.0 percent of all employment to 3.7 percent.

[22] This research is conducted in relation to preparation of the *Occupational Outlook Handbook*. See footnote 3.

[23] See Bishop and Carter, "The Worsening Shortage," p. 231.

[24] *Ibid.*, p. 237.

[25] See footnote 2.