Gender-related shifts in the distribution of wages

The Nation's wage distribution grew more unequal during the 1980's, with the top and bottom becoming more concentrated at the expense of the middle; for men, the middle "hollowed out" considerably, while for women, the middle actually "filled in," with only a small increase in the bottom of the distribution

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In recent years, U.S. wage earners have faced a variety of changes in the labor market. For example, computers and other information technologies have redefined the nature of many jobs, corporate downsizings and layoffs have altered the career paths of numerous workers, and stiffer global and domestic competition has sharpened concerns over labor costs on the part of employers. These developments and others have produced changes in the shape of the wage distribution and, for many wage earners, their location in it.

It is common knowledge today that the Nation's wage structure became more dispersed and unequal in the 1980's.[1] Not only did the gap between low-wage workers and high-wage workers widen, but the percentage of workers in the middle of the distribution thinned out, resulting in larger percentages of workers at the bottom and top. Research on growing wage inequality, which Frank Levy and Richard J. Murnane recently reviewed, has been voluminous.[2]

The cause of growing wage inequality in the 1980's, however, continues to be the subject of much research, and various explanations have been proposed. A leading candidate has been a shift in the demand for labor in favor of highly skilled and educated workers within industries. Two pairs of researchers—Lawrence F. Katz and Kevin M. Murphy, and John Bound and George Johnson—have associated these shifts with skill-biased technological change, or changes in technology that require well-trained workers.[3] The corollary to such shifts, of course, is the collapsing demand for unskilled workers during the 1980's.[4]

The growing concentration of workers with low wages and the perception that "middle class" jobs were disappearing also prompted much economic research. Not surprisingly, relative shifts in demand along skill and training dimensions were found to be responsible for the increase in low-wage employment. Gary Burtless recently wrote: "The problem they [unskilled workers] face is not an overabundance of bad jobs . . . but a surplus of unskilled workers in a market requiring more skill than ever."[5] Some research has focused on specific groups. For example, McKinley L. Blackburn, David E. Bloom, and Richard B. Freeman examined the declining economic situation of unskilled white men aged 25 to 64 years and unskilled young men aged 25 to 34 years.[6] Research of this kind, along with growing public concern over the increase in low-wage employment, prompted the Bureau of the Census to publish a report profiling the demographic and social characteristics of workers with low earnings.[7]

It is understandable why so much attention has been focused on the lower end of the wage dis-

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tribution: the greater incidence of low-wage employment among those persons who maintain families and households has serious economic and social implications. But changes have also taken place in other parts of the income distribution, changes that reflect our ever-evolving society, economy, and labor market. In a rapidly changing world of work, policymakers, the media, and the public should be aware of how the various segments of our wage distribution are being affected.

In the following descriptive analysis, attention is focused on the gender-related shifts that have taken place in the Nation's wage distribution in the 1980's. As has been observed, earnings of women have grown faster, on average, than those of men during the period. But the distributional consequences of these disparate trends have received little attention.

The analysis begins with a brief discussion of some issues pertaining to measuring the wage distribution with the data that are analyzed. Changes in the general shapes of the total wage distribution and the wage distributions for men and women between 1979 and 1989 are then discussed. Subsequent sections are devoted to changes in the proportions of men and women employed in specific segments of the distribution. These changes are further examined by age, education, and industrial sector, and then changes between 1989 and 1992 are presented. A concluding section summarizes the findings and suggests an avenue for further research.

Measurement issues and the data

Researchers have typically relied on the income and work experience data collected in the March supplement to the Current Population Survey (CPS) to approximate the wage distribution, and I shall do the same here. However, measurement issues exist. First, while the CPS does collect data on income derived from the labor market (for example, wages, salaries, and income from self-employment), it does not provide a complete measure of the wage, because noncash compensation (for instance, certain employer-provided fringe benefits) is excluded. Second, the unit of labor input is difficult to standardize with any accuracy because the measurement of labor supplied is based on survey respondents' recall. Third, labor income in the CPS is measured across individuals and not jobs (workers may obviously have more than one job at a point in time or across time), so the basic unit of analysis is the worker. And fourth, data on earnings in the CPS are truncated at upper limits for purposes of confidentiality, thereby obscuring actual earnings levels of the highest paid workers.[8] Consequently, conclusions reached as to how the wage distribution has changed must bear these measurement issues in mind.

The primary universe for analysis is the annual *wage and salary earnings* received from all jobs by persons 15 years of age and older who usually worked 35 or more hours a week for 50 or more weeks in the year in 1979, 1989, and 1992—the universe of full-time, year-round workers. (Workers who derived earnings from self-employment are excluded because they reflect, in many instances, returns to capital as well as returns to labor.) This universe has been a popular one for economists to use in exploring inequality, because of the implicit control for hours worked.[9] The focus of the analysis to be presented is changes in the distributions between 1979 and 1989. Wage inequality rose significantly between those years, and both years reflect similar stages of the business cycle (recessions began in the following year). By contrast, data for 1992 are the latest available from the CPS, but they reflect a much different stage of the business cycle.

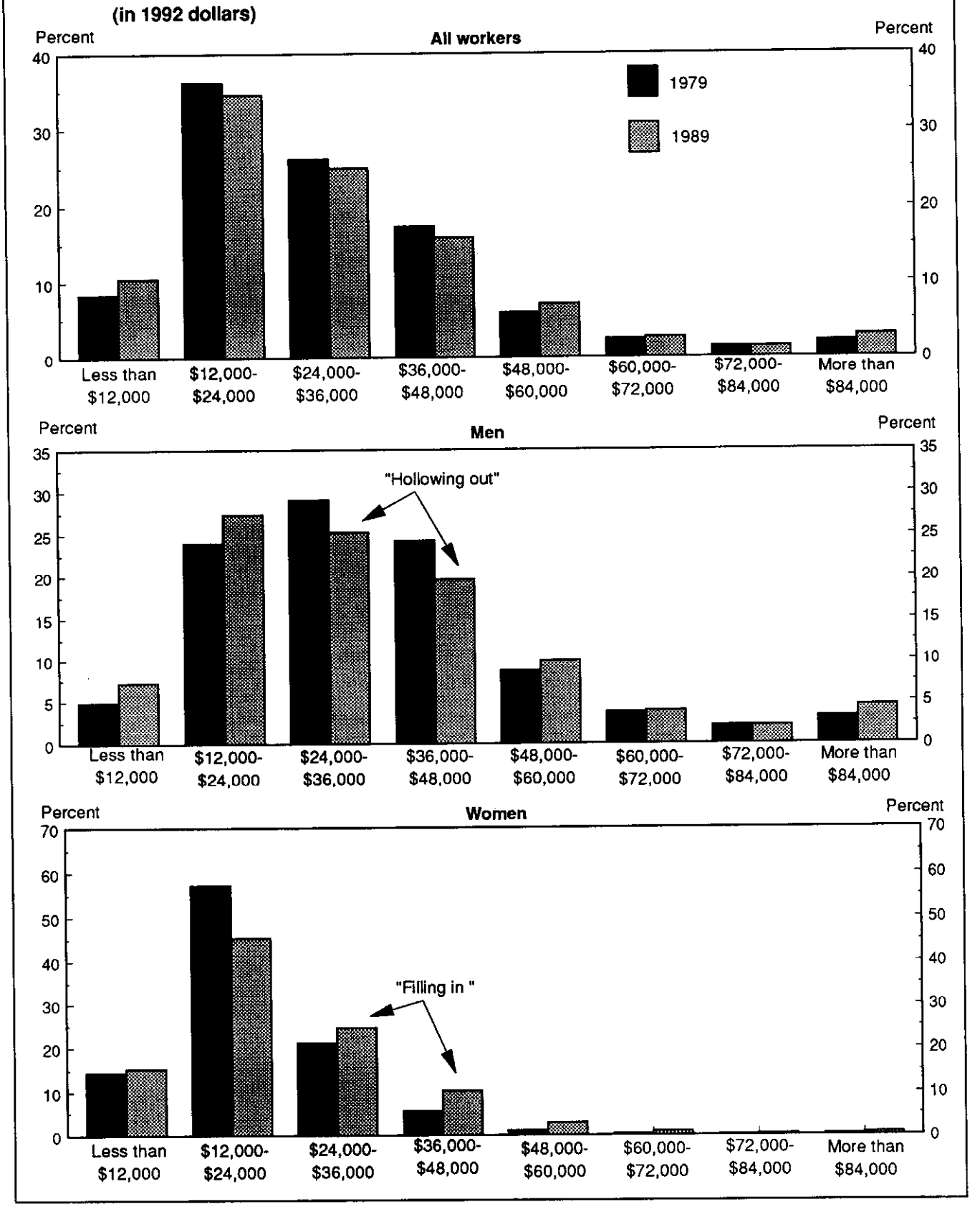
A secondary universe is the annual *earnings* (wage and salary earnings, plus net income from farms and self-employment) received by men and women employed full time, year round. This universe, which has the same limitations as the previous one, has a much more limited role in the analysis. It is used, first, to measure the long-term trend in earnings of men and women aged 15 and older between 1960 and 1992 and, second, to measure trends in the earnings of men and women aged 25 and older, by educational categories, between 1979 and 1989.[10]

The shapes of the distributions

If we assume that the distribution of wage and salary earnings of workers employed usually full time, year round in 1979 and 1989 are rough approximations of the Nation's wage structure in those years, it is clear that the shape of that wage structure has changed. Table 1 presents the proportions of workers, in constant 1992 dollar earnings intervals, in 1979 and 1989; the mean and median wage and salary earnings for those years; and the Gini index for the same years.[11] Chart 1, panel 1, depicts the shape of the distributions in those years.

The earnings distributions in both 1979 and 1989 sketch out a classic picture: distributions that are positively skewed, with a long tail to the right. A closer inspection of the chart and the table reveals the changes that have taken place during the 1980's. First, while mean earnings of year-round, full-time workers rose from $30,485 to $31,728 (in 1992 dollars), the median in 1989

Chart 1. **Distribution of wages and salaries of full-time, year-round workers, 1979 and 1989 (in 1992 dollars)**



was not much different from what it was in 1979. Second, and as might be expected from the first observation, the Gini index rose from .315 to .345, indicating that the distribution became substantially more unequal. And third, the proportion of workers in the great middle of the distribution, those who earned between $24,000 and $48,000, declined (as did the proportion of those earning between $12,000 and $24,000), while the proportion of workers earning lower wages and the proportion earning higher wages each increased.[12] These are what most people have come to understand about how the Nation's wage structure changed in the 1980's.

When we dip below the surface of these distributions and examine the distributions of men and women in the context of the overall distribution, however, other changes, some of which are not well known, emerge. To begin, shifts in the earnings distribution for men were more pronounced than in the overall distribution. Both table 1 and chart 1, panel 2, show that the thinning of the middle—those earning from $24,000 to $48,000—was more severe for men than for all workers: the middle proportion dropped from 53.4 percent of all men in 1979 to 44.9 percent in 1989.[13] The proportions with earnings below this range increased from 28.9 percent to 34.6 percent, and the proportions with earnings above the range rose from 17.7 percent to 20.4 percent. So there was a definite thickening in the bottom of the distribution, which dragged down men's real median earnings, while the upper part of the distribution became slightly more concentrated, which helped pull up their real mean earnings.

Developments in the women's earnings distribution were different, even though inequality also increased, as measured by their Gini index. Chart 1, panel 3, shows that the women's earnings distribution, in both 1979 and 1989, was considerably more compressed than the men's, but changes nevertheless took place. In sharp contrast to the situation for men, the proportion of women with earnings between $24,000 and $48,000—the important middle—actually increased from 26.6 percent to 34.9 percent of women wage and salary workers employed full time, year round during the 1980's. In other words, these intervals were "filling in" (unlike the situation for men), as were the intervals above the middle (from 1.8 percent to 4.5 percent). The source of this upward movement in the women's distribution (at least in the sense of net changes) was the large cluster of women in the $12,000- to $24,000-a-year range, which declined by more than 10 percentage points. The percentage of women in full-time, year-round employment earning less than $12,000 a year increased slightly, from 14.4 percent to 15.3 percent.

The reasons for the distributional developments among women are not well understood. It is known, of course, that the earnings of women in the 1980's advanced more rapidly than those of men.[14] (As shown in table 1, the median wage and salary earnings of men fell from $32,231 to $30,549, or 5.2 percent, while for women, it increased from $18,960 to $20,932, or 10.4 percent.) As a consequence, the gender pay gap closed significantly.[15]

Long-term trends in median annual earnings (wage and salary earnings, plus net income from farm and nonfarm self-employment) for men and women with full-time, year-round employment are shown in chart 2. Both trends were fairly similar over the 1960's and 1970's, but then, in the 1980's, they diverged.

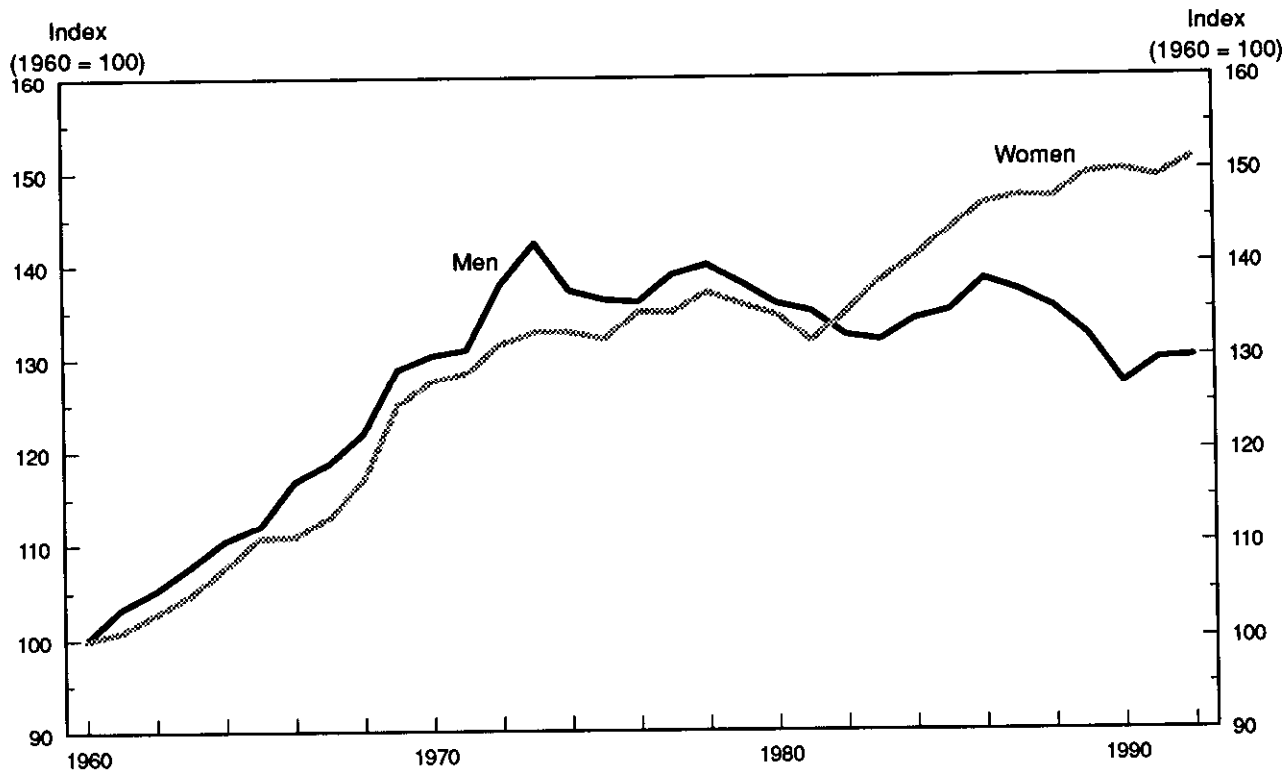
An explanation for the acceleration in women's earnings during the 1980's, at least in terms of higher wages or longer hours, appears to rest entirely on increases in earnings per

Table 1. **Distribution of wage and salary earnings of full-time, year-round workers, by gender, 1979 and 1989**

[In 1992 dollars]

Intervals	Total		Men		Women	
	1979	1989	1979	1989	1979	1989
Total (in thousands)	57,209	72,120	36,277	42,987	20,932	29,133
Total (in percent)	100.0	100.0	100.0	100.0	100.0	100.0
Less than $12,000	8.4	10.5	4.9	7.2	14.4	15.3
$12,000 to $23,999	36.2	34.6	24.0	27.4	57.2	45.3
$24,000 to $35,999	26.2	25.0	29.1	25.3	21.2	24.6
$36,000 to $47,999	17.4	15.9	24.3	19.6	5.4	10.3
$48,000 to $59,999	5.9	7.1	8.7	9.9	1.0	2.8
$60,000 to $71,999	2.4	2.6	3.7	3.9	.3	.8
$72,000 to $83,999	1.4	1.4	2.1	2.1	.2	.3
$84,000 and over	2.1	2.9	3.2	4.5	.3	.6
Mean	$30,485	$31,728	$36,065	$37,051	$20,816	$23,874
Median	$26,543	$26,023	$32,231	$30,549	$18,960	$20,932
Gini index	.315	.345	.293	.345	.253	.293

Chart 2. **Trends in earnings of men and women who worked full time, year round, 1960-92**



NOTE: Median earnings have been adjusted for inflation by the CPI-U-X1. In 1960, men earned $23,389 and women, $14, 191.

hour.[16] Beyond this, researchers, such as Bound and Johnson, have speculated that women's relatively greater wage growth may have been due to changes in technologies that were more favorable to them because of the types of occupations they work in, as well as to improvements in the quality of their labor.[17]

Regarding the latter factor, the proportion of women working full time, year round rose dramatically in the 1980's (from 43.4 percent to 51.1 percent), and much of this jump was no doubt related to the growing proportion of college-educated women. But even when educational attainment is controlled for, as in table 2, the earnings of women changed more favorably than did those of their male counterparts over the 1979–89 period.[18] Because wages for women were rising faster than for men across educational classes, the occupations and industries (and the nature of the work) in which women are employed become important in explaining their wage gains and, ultimately, their distributional shifts.

Employment by wage and gender

The changes in employment of men and women across the wage distribution between 1979 and 1989 can be described in a more qualitative way. We can relabel some of the constant 1992 dollar earnings intervals appearing in table 1 and collapse them into the following employment categories: *low-wage employment*, or employment yielding annual wage and salary earnings of less than $12,000; *low-to-middle-wage employment*, or employment yielding earnings of $12,000 to $23,999; *middle-wage employment*, or employment yielding $24,000 to $47,999; *middle-to-high-wage employment*, or employment yielding $48,000 to $59,999; and *high-wage employment*, or employment yielding annual earnings in excess of $60,000 a year.[19]

Table 3 shows the changing wage distribution in terms of these employment categories in 1979 and in 1989. The changes, of course, are very similar to those depicted in table 1 and chart 1. The proportions of men and the proportions of women falling into the various employment categories are quite different from one another, as are the changes between 1979 and 1989:

- Middle-wage employment was hollowing out for men, but filling in for women.
- Low-wage and low-to-middle-wage employment increased for men, but only low-wage employment increased for women.
- High-wage and middle-to-high-wage employment increased for both men and women.

The net changes in these employment categories, shown in table 4, highlight important developments in the men's and women's wage distributions. Although employment in the lower half of the distributions increased for both men and women, the economy was also generating middle-wage to high-wage employment opportunities. The gains in middle-wage employment—employment paying $24,000 to $48,000—were exclusively among women. Almost 4.6 million additional women entered the middle ranks of the Nation's wage distribution from 1979 to 1989. And even while employment gains above these pay levels were dominated by men, who increased their numbers in the upper levels of pay by 2.4 million, nearly 1.0 million women moved into the upper ranks of the distribution as well.[20]

In the following sections, we examine these gender-related shifts in the employment categories by various characteristics. We do this primarily by examining changes in the *proportions* of workers in those categories.

Age and education

The increase of almost 15 million full-time, year-round wage and salary workers between 1979 and 1989 was nearly equally divided between men (45 percent) and women (55 percent). This was despite the fact that prior to then, full-time, year-round employment had been primarily the domain of men.

Table 5 presents the changes that occurred in the employment categories for two broad age classes of men and women: those aged 20 to 29 years and those aged 30 to 54 years. As has been reported in the literature, young workers, especially those with few skills, have experienced great difficulty in the job market in recent years.[21] The table shows that, although the wage structure of young women was more heavily composed of low-wage and low-to-middle-wage employment than that of young men, the situation was changing in the 1980's. All of the decline in middle-wage employment for men was offset by rising proportions of low-wage and low-

Table 2. **Mean annual earnings of full-time, year-round workers aged 25 and older, by gender and educational attainment, 1979 and 1989**

[In 1992 dollars]

Educational attainment	Men			Women		
	1979	1989	Percent change	1979	1989	Percent change
Total	$36,273	$39,145	7.9	$20,641	$24,669	19.5
Less than 9 years	24,598	21,558	−12.4	14,261	14,278	.1
9 to 11 years	28,071	25,431	−9.4	16,491	16,584	.6
12 years	32,421	32,008	−1.2	19,028	20,710	8.8
13 to 15 years	36,027	37,444	3.9	21,631	24,982	15.5
16 years	46,399	49,630	7.0	25,222	31,282	24.0
17 or more years	56,137	62,736	11.8	32,096	38,422	19.7

Table 3. **Distribution of wage and salary earnings of full-time, year-round workers, by gender and employment categories, 1979 and 1989**

Gender and year	Total (thousands)	Total (percent)	Employment category[1]				
			Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Total:							
1979	57,209	100.0	8.4	36.2	43.7	5.9	5.9
1989	72,120	100.0	10.5	34.6	40.9	7.1	7.0
Change	14,911	—	2.1	−1.4	−2.8	1.2	1.1
Men:							
1979	36,277	100.0	4.9	24.0	53.4	8.7	8.9
1989	42,987	100.0	7.2	27.4	44.9	9.9	10.5
Change	6,710	—	2.3	3.4	−8.5	1.2	1.6
Women:							
1979	20,932	100.0	14.4	57.2	26.7	1.0	.7
1989	29,133	100.0	15.3	45.3	34.9	2.8	1.7
Change	8,201	—	.9	−11.9	8.2	1.8	1.0

[1] Categories are defined in terms of 1992 dollars as follows: low wage—annual earnings of less than $12,000; low-to-middle wage—$12,000 to $23,999; middle wage—$24,000 to $47,999; middle-to-high wage—$48,000 to $59,999; high wage—$60,000 or more.

Table 4. **Employment of full-time, year-round workers, by gender and employment categories, 1979 and 1989**

[Numbers in thousands]

Gender and year	Total	Employment category[1]				
		Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Total:						
1979	57,209	4,797	20,683	24,970	3,365	3,394
1989	72,120	7,569	24,969	29,464	5,099	5,019
Change	14,911	2,772	4,286	4,494	1,734	1,625
Men:						
1979	36,277	1,783	8,710	19,388	3,152	3,245
1989	42,987	3,108	11,785	19,298	4,275	4,520
Change	6,710	1,325	3,075	-90	1,123	1,275
Women:						
1979	20,932	3,014	11,974	5,582	214	149
1989	29,133	4,460	13,183	10,165	824	499
Change	8,201	1,446	1,209	4,583	610	350

[1] Categories are defined in terms of 1992 dollars as follows: low wage—annual earnings of less than $12,000; low-to-middle wage—$12,000 to $23,999; middle wage—$24,000 to $47,999; middle-to-high wage—$48,000 to $59,999; high wage—$60,000 or more.

to-middle-wage employment. By contrast, while there was some increase in low-wage employment (from 15.0 percent to 19.4 percent) for young women, there were larger increases in these women's middle-wage employment and above (from 20.8 percent to 28.4 percent).

Among older men and women, a similar situation prevailed. Middle-wage employment for men aged 30 to 54 was sharply reduced, from 57.2 percent to 48.6 percent of all such men; and while there was some relative increase in employment above that level, low-wage and low-to-middle-wage employment among older men increased from 19.7 percent to 26.2 percent. For women in this age range, on the other hand, the decline in low-to-middle-wage employment of 11.9 percentage points was offset by increases in middle-wage, middle-to-high-wage, and high-wage employment. (Their net change in low-wage employment was not statistically significant at the 10-percent level.)

As mentioned earlier, economists have found that educational attainment became an increasingly important factor in determining one's position in the wage distribution during the 1980's. Returns to education (as measured, for example, by relative wage differences between college-educated and high school-educated workers) rose sharply in that decade after falling during the 1970's.[22] Table 5 also shows the changing wage distributions of young men and women and older men and women who completed 12 or fewer years of school (high school or less) and who completed 16 or more years of school (college or more). The changes reflect this educational effect, but also the effect of gender.

For young men and women aged 20 to 29 years with high school educations or less, the proportions with low-wage employment increased dramatically—from 9.6 percent to 17.4 percent for young men and from 19.0 percent to 28.3 percent for young women. In addition, for young men, low-to-middle-wage employment became more common. Consequently, job opportunities for young workers with high school educations or less changed radically in the 1980's. The situation was somewhat brighter for their counterparts with college educations—especially young women, for whom there was a large relative increase into middle-wage employment, from 38.3 percent to 52.6 percent—as a result of the over-the-decade decline in the percentage of low-to-middle-wage employment. Among young men, there was a modest decline in middle-wage employment, from 64.2 percent to 59.9 percent.

Older men and women with high school educations or less, of course, typically have more work experience than their younger counterparts, and in 1989, smaller proportions of them were in low-wage employment. Nevertheless, low-wage employment and low-to-middle-wage employment increased relatively for the men (from 26.8 percent to 38.5 percent), and low-wage employment increased for the women (from 16.2 percent to 18.7 percent). However, the older women also moved into middle-wage employment, which increased from 21.7 percent to 26.1 percent of all women in this age and education category.

The brightest picture, of course, was for college-educated men and women aged 30 to 54 years. While there was a slight increase in the percentage of low-to-middle-wage employment for men (from 7.4 percent to 9.2 percent), their proportions in middle-to-high-wage and high-wage employment rose from 42.9 percent to 48.0 percent between 1979 and 1989. College-educated women remained concentrated in middle-

wage employment paying $24,000 to $48,000 annually, but they did increase their proportions in middle-to-high and high-wage employment (from 7.4 percent to 15.2 percent).

Industrial attachment and education

One of the important developments often associated with growing wage inequality has been the changes taking place in the economy's industrial structure. Indeed, "deindustrialization," or the shift in employment from industries involved in the production of goods to industries involved in providing services, was considered a primary contributor to greater wage inequality.[23] The fact that wage inequality, however, was increasing *within* most industries suggested that other forces were at work as well.[24] In this section, we examine how the wage distributions of men and women changed across various industries.

Table 6 displays the proportions of men and women who worked full time, year round in the five employment categories as of 1979 and 1989, by four broad industrial sectors. Data for the manufacturing industry are displayed separately, because this industry is one of those often focused on in discussions such as the present one and because it represents a major part of all goods-producing industries. The other goods-producing industries are agriculture, forestry and

Table 5. **Distribution of wage and salary earnings of full-time, year-round workers aged 20 to 29 years and 30 to 54 years, by employment categories, 1979 and 1989**

Age, gender, and year	Total (thousands)	Total (percent)	Employment category[1]				
			Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Age 20 to 29 years							
Men:							
1979	9,595	100.0	7.5	38.6	49.3	3.3	1.4
1989	10,340	100.0	13.8	44.5	37.1	2.8	1.7
Change	745	...	6.3	5.9	–12.2	–.5	.3
Women:							
1979	6,562	100.0	15.0	64.2	20.1	.4	.3
1989	7,469	100.0	19.4	52.3	26.6	1.1	.7
Change	907	...	4.4	–11.9	6.5	.7	.4
Age 30 to 54 years							
Men:							
1979	20,525	100.0	2.6	17.1	57.2	11.4	11.7
1989	27,188	100.0	4.3	21.9	48.6	12.0	13.1
Change	6,663	...	1.7	4.8	–8.6	.6	1.4
Women:							
1979	10,910	100.0	12.2	54.4	31.1	1.5	.9
1989	18,158	100.0	12.3	42.5	39.5	3.6	2.2
Change	7,248	...	.1	–11.9	8.4	2.1	1.3
Age 20 to 29 years, high school or less							
Men:							
1979	5,525	100.0	9.6	43.7	44.4	2.3	.9
1989	6,171	100.0	17.4	52.8	28.1	1.2	.5
Change	546	...	7.8	9.1	–15.3	–1.1	–.4
Women:							
1979	3,650	100.0	19.0	68.6	12.2	.1	.1
1989	3,527	100.0	28.3	58.2	12.9	.5	.2
Change	–123	...	9.3	–9.4	.7	.4	.1
Age 20 to 29 years, college or more							
Men:							
1979	1,751	100.0	2.4	24.0	64.2	6.3	3.1
1989	2,072	100.0	5.2	22.2	59.9	7.3	5.4
Change	321	...	2.8	–1.8	–4.3	1.0	2.3
Women:							
1979	1,375	100.0	5.2	54.3	38.3	1.5	.8
1989	1,977	100.0	5.8	37.1	52.6	2.7	1.9
Change	602	...	.6	–17.2	14.3	1.2	1.1

See footnote at end of table

Table 5. **Continued—Distribution of wage and salary earnings of full-time, year-round workers, aged 20 to 29 years and 30 to 54 years, by employment categories, 1979 and 1989**

Age, gender, and year	Total (thousands)	Total (percent)	Employment category[1]				
			Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Age 30 to 54 years, high school or less							
Men:							
1979	11,249	100.0	3.5	23.3	59.9	8.6	4.7
1989	12,992	100.0	7.0	31.5	49.7	7.6	4.3
Change	1,743	...	3.5	8.2	–10.2	–1.0	–.4
Women:							
1979	6,936	100.0	16.2	61.2	21.7	.6	.3
1989	9,421	100.0	18.7	53.5	26.1	1.1	.7
Change	2,485	...	2.5	–7.7	4.4	.5	.4
Age 30 to 54 years, college or more							
Men:							
1979	5,666	100.0	1.4	7.4	48.3	16.4	26.5
1989	8,405	100.0	1.4	9.2	41.3	18.5	29.5
Change	2,739	...	.0	1.8	–7.0	2.1	3.0
Women:							
1979	2,068	100.0	3.1	30.1	59.3	4.5	2.9
1989	4,663	100.0	2.9	20.4	61.4	9.6	5.6
Change	2,595	...	–.2	–9.7	2.1	5.1	2.7

[1] Categories are defined in terms of 1992 dollars as follows: low wage—annual earnings of less than $12,000; low-to-middle wage—$12,000 to $23,999; middle wage—$24,000 to $47,999; middle-to-high wage—$48,000 to $59,999; high wage—$60,000 or more.

fisheries, mining, and construction. Service-producing industries have been divided into two groups for the purpose of this article: high-paying and low-paying service-producing industries. The former comprise transportation, communications, and public utilities; wholesale trade; finance, insurance, and real estate; professional and related services; and public administration. The latter consist of retail trade, business and repair services, personal services, and entertainment and recreation services. Obviously, there are many well-paid workers in the low-paying service-producing industries and many low-paid workers in the high-paying service-producing industries, but *average* pay levels suggest such groupings.[25]

The table shows that the employment increases for men and women between 1979 and 1989 differed considerably by industry. For men, 43 percent of the 5.9 million employment gain was in the low-paying service-producing industries, while employment in manufacturing actually declined. For women, only 29 percent of their 8.2 million increase took place in low-paying service-producing industries, and 61 percent occurred in high-paying service-producing industries.

The impact of these changes on men's and women's wage distributions is also shown in table 6. Clearly, the story for men across all sectors was that middle-wage employment eroded significantly between 1979 and 1989. Indeed, in manufacturing, the proportion of workers in middle-wage employment fell more than 10 percentage points (an absolute decline of 1.4 millon men). Low-wage and low-to-middle-wage employment increased (5.9 percentage points), but so did middle-to-high-wage and high-wage employment (4.6 percentage points).

Developments for men in the high-paying and low-paying service-producing industries were quite different. In both sectors, middle-wage employment declined, but in the former, there was a slightly greater increase in employment in the upper part of the distribution than in the bottom. In the low-paying service-producing industries, low-wage employment increased from 9.1 percent to 13.9 percent between 1979 and 1989.

For women, the major development across all sectors was the increase in middle-wage employment and decline in low-to-middle-wage employment. This was particularly noteworthy in the high-paying service-producing industries, where the percentage with employment paying between $24,000 and $48,000 rose from 32.1 percent to 41.5 percent. Approximately 3.2 million of the total net increase in women's employment—39

percent—occurred in this single employment category. Even in manufacturing and low-paying service-producing industries, middle-wage employment expanded for women. Low-wage employment for women increased somewhat in the low-paying service-producing industries, but the increase in manufacturing was not statistically significant.

An additional perspective on these relative changes in men's and women's wage distributions is presented in table 7, which shows the absolute changes in the distributions in terms of three educational categories (a high school education or less, some college, and 4 or more years of college) and three *broad* wage categories (less than $24,000, $24,000 to $48,000, and $48,000 or more). From the table, it is evident that, for men with high school educations or less, middle-wage employment—$24,000 to $48,000—was collapsing in the 1980's. In manufacturing alone, *1.4 million* fewer men with high school educations or less were working in this wage category in 1989 than in 1979. Related to this development, of course, was the increase in employment across all industrial sectors paying less than $24,000 a year: an additional 2.6 million men with high school educations or less fell into this category.

Perhaps even more disturbing was the 1.3 million increase in employment across all sectors paying less than $24,000 a year for men who ei-

Table 6. **Distribution of wage and salary earnings of full-time, year-round workers, by industrial sector and employment categories, 1979 and 1989**

Industrial sector, gender, and year	Total (thousands)	Total (percent)	Employment category[1]				
			Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Men							
Manufacturing:							
1979	11,873	100.0	3.1	20.2	58.9	9.6	8.3
1989	11,534	100.0	4.7	24.5	48.3	11.9	10.6
Change	–339	...	1.6	4.3	–10.6	2.3	2.3
Other goods-producing industries:							
1979	3,924	100.0	10.3	27.3	46.9	8.4	7.1
1989	4,853	100.0	11.1	33.0	40.3	7.9	7.7
Change	929	...	.8	5.7	–6.6	–.5	.6
High-paying service-producing industries:							
1979	14,194	100.0	3.1	21.8	54.2	9.7	11.2
1989	16,959	100.0	4.4	22.5	48.5	11.5	13.2
Change	2,765	...	1.3	.7	–5.7	1.8	2.0
Low-paying service-producing industries:							
1979	6,286	100.0	9.1	34.2	45.6	4.9	6.2
1989	8,820	100.0	13.9	35.8	37.0	5.9	7.4
Change	2,534	...	4.8	1.6	–8.6	1.0	1.2
Women							
Manufacturing:							
1979	4,488	100.0	13.1	61.8	24.2	.7	.3
1989	5,022	100.0	14.7	49.5	32.0	2.4	1.3
Change	534	...	1.6	–12.3	7.8	1.7	1.0
Other goods-producing industries:							
1979	374	100.0	16.2	60.9	21.5	.3	1.1
1989	606	100.0	16.0	44.3	35.6	2.0	2.1
Change	232	...	–.2	–15.6	14.1	1.7	1.0
High-paying service-producing industries:							
1979	11,986	100.0	10.1	55.7	32.1	1.3	.9
1989	16,991	100.0	9.4	43.9	41.5	3.2	2.0
Change	5,005	...	–.7	–11.8	9.4	1.9	1.1
Low-paying service-producing industries:							
1979	4,085	100.0	28.5	56.3	14.0	.5	.7
1989	6,472	100.0	31.4	45.4	19.7	2.3	1.3
Change	2,387	...	2.9	–10.9	5.7	1.8	.6

[1] Categories are defined in terms of 1992 dollars as follows: low wage—annual earnings of less than $12,000; low-to-middle wage—$12,000 to $23,999; middle wage—$24,000 to $47,999; middle-to-high wage—$48,000 to $59,999; high wage—$60,000 or more.

NOTE: Figures for 1989 exclude persons who were members of the Armed Forces living off post or with their families on post.

Table 7. **Net changes in employment of full-time, year-round workers between 1979 and 1989, by industrial sector, broad wage categories, and education categories**

[Numbers in thousands]

Industrial sector and wage category	Education category[1]					
	Men			Women		
	High school or less	Some college	College or more	High school or less	Some college	College or more
Manufacturing:						
Less than $24,000	448	64	95	-244	50	61
$24,000 to $47,999	-1,423	-39	43	108	202	213
$48,000 or more	-24	108	388	22	27	96
Other goods-producing industries:						
Less than $24,000	569	96	2	30	36	11
$24,000 to $47,999	21	60	35	44	45	46
$48,000 or more	47	36	63	4	3	12
High-paying service-producing industries:						
Less than $24,000	587	230	192	324	664	191
$24,000 to $47,999	-372	379	518	629	959	1,622
$48,000 or more	-72	196	1,106	88	87	440
Low-paying service-producing industries:						
Less than $24,000	1,044	390	225	923	393	189
$24,000 to $47,999	-35	160	267	160	223	317
$48,000 or more	1	108	371	16	49	117

[1] Categories are defined as follows: high school or less—persons who have completed 12 or less years of education; some college—persons who have completed 13 to 15 years of education; college or more—persons who have completed 16 or more years of education.

NOTE: Figures for 1989 exclude persons who were members of the Armed Forces living off post or with their families on post.

Table 8. **Distribution of wage and salary earnings of full-time, year-round workers, by employment categories, 1989 and 1992**

Gender and year	Total (thousands)	Total (percent)	Employment category[1]				
			Low wage	Low-to-middle wage	Middle wage	Middle-to-high wage	High wage
Men:							
1989	42,987	100.0	7.2	27.4	44.9	9.9	10.5
1992	42,091	100.0	7.5	27.0	45.1	8.8	11.6
Change	-896	...	.3	-.4	.2	-1.1	1.1
Women:							
1989	29,133	100.0	15.3	45.3	34.9	2.8	1.7
1992	31,039	100.0	13.8	42.8	37.6	3.5	2.3
Change	1,906	...	-1.5	-2.5	2.7	.7	.6

[1] Categories are defined in terms of 1992 dollars as follows: low wage—annual earnings of less than $12,000; low-to-middle wage—$12,000 to $23,999; middle wage—$24,000 to $47,999; middle-to-high wage—$48,000 to $59,999; high wage—$60,000 or more.

ther had some experience in college or were college educated. This development suggests that some of these workers may have skill deficiencies that are not captured in, for example, CPS data.[26]

The news was not all bad for men, however, as we have seen. For example, employment in jobs yielding $48,000 or more a year expanded by 1.1 million for men with college educations or more in the high-paying service-producing industries.

Women with high school educations or less fared poorly as well. There was almost a 1.0 million increase in their numbers in employment paying less than $24,000 in the low-paying service-producing industries between 1979 and 1989, but there was also a 629,000 increase in women with this amount of education in employment paying $24,000 to $48,000 in the high-paying service-producing industries. And, of course, middle-wage employment for women with some college or with 4 or more years of college in the high-paying service-producing industries rose by 2.6 million during the 1980's.

Changes between 1989 and 1992

With the onset of the recession in 1990, the labor market situation changed. Consequently, comparisons of earnings distributions between 1989 and 1992 must bear these changes in mind.

Table 8 shows the basic wage employment categories for men and women full-time, year-round wage and salary workers in 1989 and 1992. The impact of the recession was felt more strongly by men than by women, with men's employment level declining by 900,000, while employment for women increased by 1.9 million over the period. While there was little change in middle-wage employment for men, modest changes for women, such as those that took place between 1979 and 1989, were observed. Smaller proportions of women were employed full time, year round in low-wage and low-to-middle-wage employment, while middle-wage employment continued to increase.

Conclusions

The Nation's wage distribution grew considerably more unequal in the 1980's. The middle of the distribution thinned out, and the bottom became thicker, as did the top, but to a lesser extent. These developments, however, mask the shifts that took place in the wage distributions of men and women employed full time, year round. Distributions for both genders became more unequal during the 1980's, but in different ways. The men's distribution polarized, as the middle hollowed out, and low-wage and high-wage employment became more concentrated. On the other hand, the middle of the distribution for women filled in, with only a small increase in the proportion of women with what might be considered low wages.

A popular explanation for these shifts focuses on the growing relative demand for skilled versus unskilled workers within industries. Increases in global and domestic competition caused employers to become more cost conscious and more concerned with enhancing productivity via new communication and production technologies. Such technologies required highly trained and well-educated workers, for whom employers were willing to pay a premium. The data presented in this article tend to support this explanation, even though there were increases in low-wage employment for young men with college educations and increases in middle-wage employment for some women with high school educations or less.

More generally, the overall shift in the women's distribution toward middle-wage employment at the same time that this part of the distribution for men was eroding raises interesting research questions. Relative shifts in labor demand for more skilled and educated workers within industries are measured by responses to specific survey questions on educational attainment and occupational attachment, which may not entirely capture the "true" skill and education profiles of workers.[27] For example, Alan B. Krueger recently found that workers who use computers on the job earn 10 to 15 percent higher wages than similar workers who do not and that women are more likely to be using them on the job than are men.[28] Consequently, subsequent research into understanding the gender-related shifts that took place in the wage distributions of men and women during the 1980's will somehow have to take into account the unobserved skills and abilities that workers possess.

Footnotes

[1] It is not as well known, however, that wage inequality was on the rise (especially among men) *before* the 1980's. See, for example, Peter Henle and Paul Ryscavage, "The distribution of earned income among men and women, 1958–77," *Monthly Labor Review*, April 1980, pp. 3–10.

[2] See Frank Levy and Richard J. Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature*, September 1992, pp. 1333–81.

[3] See Lawrence F. Katz and Kevin M. Murphy, "Changes in Relative Wages, 1963–1987: Supply and Demand Factors," *Quarterly Journal of Economics*, Vol. CVII, No. 1, February 1992, pp. 35–78; and John Bound and George Johnson, "Changes in the Structure of Wages in the 1980's: An Evaluation of Alternative Explanations," *American Economic Review*, Vol. 82, No. 3, June 1992, pp. 371–92. See also Maury Gittleman, "Earnings in the 1980's: an occupational perspective," this issue, pp. 16–27.

[4] A major consequence of these relative wage shifts has been growing inequality in the distribution of incomes among families and households, for whom success or failure in the job market is usually the most important determinant of economic well-being.

Another contributing factor to rising income inequality among families and households mentioned in the literature has been changes in family composition, especially a shift from married-couple to single-parent families. (See, for example, Lynn Karoly, "The Trend in Inequality among Families, Individuals, and Workers in the United States: A Twenty-Five Year Perspective," in Sheldon Danziger and Peter Gottschalk, eds., *Uneven Tides: Rising Inequality in the 1980s* (New York, Russell Sage Foundation, 1993); and Paul Ryscavage, Gordon Green, and Edward Welniak, "The Impact of Demographic, Social, and Economic Change on the Distribution of Income," in *Studies in the Distribution of Income*, Current Population Reports, Consumer Income, P60–183 (Washington, DC, Bureau of the Census, October, 1992).)

Lately, interest has focused on a rising correlation between recent gains in women's earnings and family income, particularly with regard to women in affluent families. (See Lynn A. Karoly and Gary Burtless, "The Effects of Rising Earnings Inequality on the Distribution of U.S. Income," unpublished manuscript, December 1993.)

[5] See Gary Burtless, "Introduction and Summary," in Gary Burtless, ed., *A Future of Lousy Jobs? The Changing Structure of U.S. Wages* (Washington, DC, The Brookings Institution, 1990), p. 30.

[6] See McKinley L. Blackburn, David E. Bloom, and Richard B. Freeman, "The Declining Economic Position of Less Skilled American Men," in Burtless, *A Future of Lousy Jobs?* pp. 31–76.

[7] See John McNeil, *Workers with Low Earnings: 1964 to 1990*, Current Population Reports, Consumer Income, Series P–60, No. 178 (Washington, DC, Bureau of the Census, March 1992); updated to 1992 in "The Earnings Ladder," *Statistical Brief* (Washington, DC, Bureau of the Census, February 1994).

[8] In March 1980, the highest amount that could be recorded on the CPS questionnaire for income earned on the longest held job (in 1979) was $99,999, and the same amount could be recorded from all other jobs; in March 1990 and March 1993, the highest amount that could be recorded from the longest held job was $299,999, and $99,999 could be recorded from all other jobs (for income earned in 1989 and 1992, respectively). These maximum amounts in public-use data files are lower than those in internal files maintained by the Census Bureau.

[9] Variation in hours is still present to some extent, however, not only because of the open-ended nature of the hours control, but also because some workers may actually have worked fewer than 35 hours in some weeks.

Another problem with the universe concerns selection bias, because this particular universe is a selected sample of all workers. Even though the primary years of analysis—1979 and 1989—reflect similar stages of the business cycle, workers employed full time, year round are not necessarily a random sample of all workers.

A last point about this universe is that these persons may have had more than one employer and a period of unemployment or an absence from the labor force for 1 or 2 weeks.

[10] These data were obtained from various editions of *Money Income of Households, Families, and Persons in the United States: 1992*, Current Population Reports, Consumer Income, Series P–60–184 (Washington, DC, Bureau of the Census, September 1993).

[11] Workers' nominal wages and salaries were adjusted for price inflation using the experimental Consumer Price Index for all Urban Workers, or CPI-U-X1, of the Bureau of Labor Statistics (BLS).

The Gini index is a commonly used measure of inequality. If all wage earners received the same earnings, the Gini index would be equal to 0; if all earnings were received by just one wage earner, the index would be equal to 1. Rising inequality, therefore, is represented by a rising Gini index.

[12] Statistical changes in the distributions have been tested for significance at the 10-percent confidence level and can be assumed to be statistically significant unless otherwise stated.

[13] Frank Levy and Richard J. Murnane characterize this development as "hollowing out." See Levy and Murnane, "U.S. Earnings Levels and Earnings Inequality," p. 1349.

[14] Growth rates were also examined along points or segments of the distributions. For this analysis, changes in mean earnings of ventiles of the distributions between 1979 and 1989 were studied. It was found that for women, earnings decreases occurred only at the second and third ventiles, and thereafter progressively greater increases occurred. For men, earnings growth began only at the 14th ventile and then became progressively greater.

[15] The gender pay gap, or, as defined here, the ratio of women's to men's median annual earnings for full-time, year-round workers, changed suddenly in the decade of the 1980's. In 1960 the ratio was .607, in 1970 .594, and in 1980 .602; but by 1989 it jumped to .685 (by 1992 it had reached .706). See *Money Income*, Table B–10, p. B–37.

[16] See Michael W. Horrigan and James P. Markey, "Recent gains in women's earnings: better pay or longer hours?" *Monthly Labor Review*, July 1990, pp. 11–17.

[17] See Bound and Johnson, "Changes in the Structure of Wages," p. 386.

[18] Gender pay gaps by educational class narrowed accordingly, as shown in the following tabulation:

	Ratio of female to male earnings	
Years of schooling	*1979*	*1989*
Less than 9 years	.580	.662
9 to 11 years	.587	.652
12 years	.587	.647
13 to 15 years	.600	.667
16 years	.544	.630
17 or more years	.572	.612

[19] Concern over the proliferation of low-wage jobs has prompted some researchers and Government agencies to characterize workers with annual earnings below the Federal Government's poverty threshold for a family of four (regardless of whether the worker maintains a family or a household) as low-wage earners. (See, for example, Gregory Acs and Sheldon Danziger, "Educational Attainment, Industrial Structure, and Male Earnings through the 1980s," *Journal of Human Resources*, Vol. 28, No. 3, Summer 1993, pp. 619–48; and McNeil, *Workers with Low Earnings*.)

The constant-dollar amount of $11,999 used here as a measure of low-wage employment was slightly higher than the Federal Government's poverty line for a three-person family of $11,186 in 1992. Average family size that year was 3.16.

[20] There are various ways to show how the distribution of wages by gender has changed. For example, we can calculate the proportion of women in the categories shown in the following tabulation:

	Percent	
	1979	*1989*
Total	36.6	40.4
Low-wage employment	62.8	58.9
Low-to-middle-wage employment	57.9	52.8
Middle-wage employment	22.4	34.5
Middle-to-high-wage employment	6.3	16.2
High-wage employment	4.4	9.9

Clearly, women continue to make up the majority of those in the lower pay categories, but their greater penetration into the middle of the distribution and higher during the 1980's is without question.

[21] See, for example, Blackburn, Bloom, and Freeman, "Less Skilled American Men," in Burtless, *A Future of Lousy Jobs?*

[22] Levy and Murnane, "Earnings Levels and Earnings Inequality."

[23] See, for example, Barry Bluestone and Bennett Harrison, *The Great American Job Machine: The Proliferation of Low Wage Employment in the U.S. Economy*, Report to the Joint Economic Committee of the U.S. Congress, Washington, DC, December 1986.

[24] This fact has been documented by many researchers. For example, see Henle and Ryscavage, "Distribution of earned income"; and Robert Z. Lawrence, "Sectoral Shifts and the Size of the Middle Class," *Brookings Review*, Fall 1984, pp. 3–11.

[25] Annual earning levels of men working full time, year round in 1987 were used in this classification scheme.

[26] See Gary Burtless, "Rising Wage Inequality and the Future of Work in America," unpublished manuscript, November 1993.

[27] Levy and Murnane ("Earnings Levels and Earnings Inequality," p. 1372), as well as Burtless ("Rising Wage Inequality," p. 26), have suggested as much.

[28] Alan B. Krueger, "How Computers Have Changed the Wage Structure: Evidence from Microdata, 1984–1989," *Quarterly Journal of Economics*, February 1993, pp. 33–60.