The Growing Inequality of Family Incomes: Changing Families and Changing Wages

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It is widely known that the incomes of U.S. families became more unequal during the 1980s. The reasons for this rise, however, are not at all clear; numerous factors have been implicated. Economists observe that inequality typically declines during periods of economic expansion as the benefits of growth "trickle down" through the entire income distribution; yet most of the 1980s was characterized by economic growth as well as by growing income inequality.

One well-documented aspect of the rise in inequality is a growing gap between the wages of highly educated workers and those of high school dropouts or workers with only a high school degree, but no one factor satisfactorily explains this growing educational premium. Some of the rise in wage inequality translates directly into inequality of family incomes, since the wages of family members comprise most of family income. Furthermore, the United States experienced shifts in the mix of family types and changes in the work patterns of family members in the 1980s and 1990s that contributed to the increase.

This article examines inequality in the United States since the 1970s and investigates a number of hypotheses about why it is rising. Part I describes the 1973–94 increase in inequality of family incomes and related shifts in wage inequality, work trends, and family patterns. Several key facts emerge. Inequality has risen much more steeply among families than among individual workers, and much of the rise is due to increases in two categories of families concentrated at the top and bottom of the income distribution, respectively: two-earner married couples and families headed by one person with no spouse present. One-head families are concentrated closer to the bottom of the income distribution than two-earner married-couple families because they have fewer workers (by definition), and also because one-head family workers average fewer work hours and earn less per hour. Combining all family types, incomes have risen for the highest-income families and declined for the lowest as families near the top of the income distribution gained in number of

workers, hours per worker, and earnings per hour relative to those near the bottom.

Part II examines patterns of inequality among the nine Census regions in the United States as well as differences in their economic and demographic characteristics. Part III investigates the relationship between family income inequality and these factors, sorting out and quantifying their contributions to overall U.S. and regional changes in inequality. In brief, changes in both economic factors and family structure have been associated with rising family income inequality over the last two decades, with the increase in single parenthood and the growing wage premium to college education playing key roles. Among regions, part-time work, low labor force participation, and large minority populations are associated with greater inequality. A discussion of policy options for reducing income inequality concludes the article.

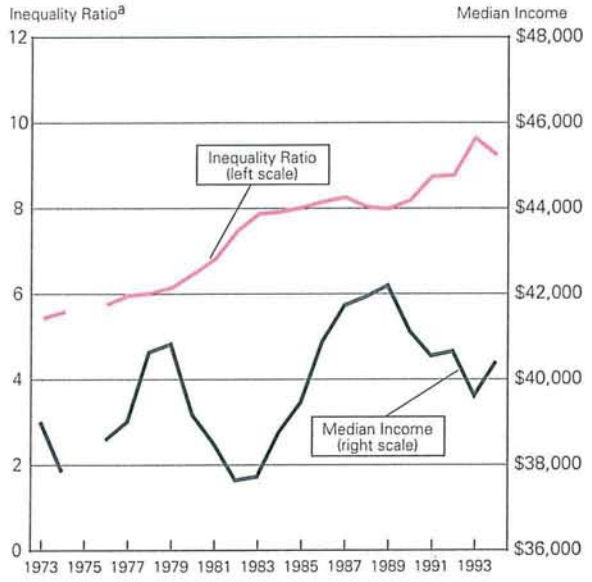
I. Patterns of Family Income Inequality in the United States, 1973 to 1994

Family income inequality increased fairly steadily during the past two decades. Figure 1 shows this upward trend in one measure of inequality. (Appendix A shows trends for alternative measures.) The measure of inequality used here is the ratio of the income of a high-income family, defined as the 90th percentile family (meaning 90 percent of families have lower incomes), to the income of a low-income family—the 10th percentile family (10 percent of families have lower incomes).[1] To facilitate comparisons between worker incomes and family incomes, this analysis focuses on nonelderly families, defined as those whose head is under age 65. Single individuals (living alone or with non-relatives) are also excluded from the analysis.[2]

As Figure 1 shows, the high-income family had about five and one-half times the income of the low-income family in 1973. In 1994, the high-income family had over nine times as much. The increase in inequality between 1973 and 1994 reflects both

Figure 1

Nonelderly Family Median Income and Income Inequality Ratio



Note: Data are missing for 1975. Median income in 1993 dollars, calculated using U.S. CPI-U-X1.

[a] Inequality measured as ratio of 90th percentile family income to 10th percentile.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974 through March 1995.

rising real incomes for those at the top of the income distribution and falling real incomes for those at the bottom. Figure 2 summarizes real income changes for families at the 10th through 90th percentiles of the income distribution, showing a significant drop in real income at the bottom, substantial real growth at the top, and remarkably regular corresponding changes in between.[3]

Inequality rises in recessions as the negative shocks to income caused by recession job cutbacks are borne more heavily by those at the bottom, and declines in expansions as jobs are regained and prosperity "trickles down" through the income distribution.[4] While Figure 1 shows increases in inequality in most years, it rose faster in the recession years 1980–82 and 1990–91 than in the expansions of the late 1970s and mid to late 1980s. Furthermore, this

[1] The income measure is the total money income of the family; no adjustments are made for family size or for in-kind, unreported, or unrealized income.

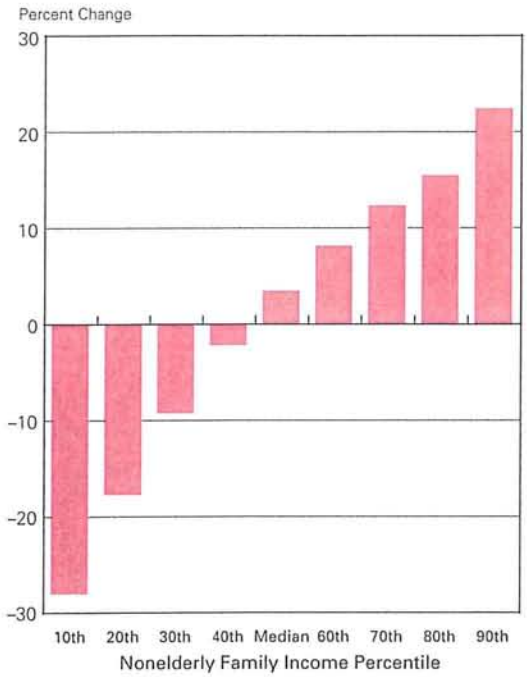
[2] The analysis is limited to "families" as defined by the U.S. Census Bureau, which consist of two or more related individuals living together. Families comprised just over 70 percent of households in the United States in 1994, down from just over 75 percent in 1973.

[3] Note that these data do not track individual families over time; rather, they measure changes from one year to another in the annual cross section of family incomes.

[4] See Appendix B for a description of year-to-year income changes at the top and bottom of the income distribution.

Figure 2

Change in Real Family Income, 1973 to 1994



Note: Constant-dollar income calculated using U.S. CPI-U-X1.
Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974 and March 1995.

measure of inequality actually declined toward the end of the expansion in 1988 and 1989, and again in 1994. Counter to the typical cyclical pattern, however, inequality climbed steeply in the recovery year of 1993 (median income declined that year, too).[5] The data thus reveal a strong upward trend to income inequality since the mid 1970s and also a cyclical pattern.

Three categories of long- and short-run influences affect the distribution of family incomes: (1) factors such as education and work hours that influence the distribution of earnings of individual workers; (2) the mix of family types and work patterns within families (which family members work and how many hours); and (3) the relationship between family earnings and other sources of family income.

Individual Earnings

Since the earnings of individual family members combine to form family earnings, and earnings comprise the bulk of family income, factors affecting the shape of the earnings distribution undoubtedly alter the shape of the family income distribution as well. Unlike the distribution of family incomes, however, individual earnings were not characterized by growing inequality until the 1980s. Presumably, changes in family structure and work patterns altered the shape of the family income distribution relative to that of individual earnings in the 1970s.

Parallel to the measure used for family incomes, earnings inequality is measured here as the ratio of annual earned income of a nonelderly high-earning (90th percentile) worker to that of a nonelderly low-earning (10th percentile) worker. For nonelderly men working full-time and year-round,[6] earnings inequality held steady between 1973 and 1979, and then the ratio rose from 4.0 in 1979 to 5.4 in 1994 (Table 1). For women, the ratio fell in the 1970s and then rose from 3.2 in 1979 to 4.5 in 1994.

For men and women combined, inequality rose in the 1980s and '90s, but less than for either men or women considered separately. The 90th percentile full-time, full-year worker had about 4.4 times the earnings of the 10th percentile worker in 1979, and 5.5 times as much in 1994. The overall earnings distribution spread out less than its male and female components because of two changes in the work roles of women. Women represented a growing share of the full-time, full-year work force, rising from 34 percent in 1979 to 40 percent in 1994. Furthermore, their labor market success was increasing: Women's earnings rose in real terms, on average, while men's real earnings declined (center panel of Table 1). In a sense, women filled out what had been the middle of the male earnings distribution: The median full-time, full-year woman's earnings rose from being about equal to the 20th percentile man's earnings in 1979 to above the 30th percentile male earner in 1994, while the 90th percentile woman moved up from the male median to above the 70th percentile man.

Many studies have sought to uncover economic and demographic causes for the growth in earnings inequality.[7] The most thoroughly studied aspect of the 1980s growth in earnings inequality is the increase in the educational wage premium: The amount by which the pay of college-educated workers exceeded that of

[5] Some of the 1993 jump and 1994 decline in inequality may reflect changes in Current Population Survey methodology; see Ryscavage (1995).

[6] Full-time is defined as working 35 or more hours per week in a majority of the weeks worked in the calendar year. Year-round (full-year) is working 50 or more weeks in the year.

[7] This literature was reviewed by Levy and Murnane in 1992 and, most recently, summarized by Kodrzycki (1996).

Table 1
Inequality of Individual Earnings
Annual Earned Income of Workers

	1973	1979	1989	1994	Change 1979–94
Earnings inequality ratio—full-time, full-year workers					Difference
Male	4.0	4.0	4.7	5.4	+1.5
Female	3.6	3.2	4.1	4.5	+1.3
Combined	4.5	4.4	5.0	5.5	+1.1
Women as percent of all full-time, full-year workers	30.8	34.5	38.8	40.0	Percentage Point +5.5
Median earnings of full-time, full-year workers (1993 $000)					Percent
Male	33.1	33.2	31.5	29.3	−11.9
Female	18.4	19.5	21.6	21.5	+9.9
Combined	27.6	27.3	26.8	25.4	−7.3
Earnings inequality ratio—workers on all work schedules					Difference
Male	18.0	16.8	16.7	17.1	+.4
Female	42.4	28.8	23.1	22.5	−6.3
Combined	33.3	26.8	21.0	21.4	−5.4
Percent of workers on full-time, full-year schedules					Percentage Point
Male	68.5	66.9	70.3	70.6	+3.7
Female	41.9	43.9	51.9	53.7	+9.8
Combined	57.3	56.7	61.8	62.7	+6.0

Note: Inequality measured as ratio of earnings of 90th percentile worker to earnings of 10th percentile worker. Constant-dollar earnings calculated using U.S. CPI-U-X1.
Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, 1980, 1990, and 1995.

high school graduates or high school dropouts grew considerably in the 1980s. (See the box.) Slower growth in the supply of college-educated workers than in the demand for them (and the opposite for workers with less education) is commonly cited as the cause of the growing gap in pay between college-educated and less educated workers. Supply changes include two demographic shifts—a slowdown in the rate of increase in the college-educated work force as the baby boom generation moved beyond the typical college-completing years, and a shift in the mix of immigrants toward less-skilled workers. Most reviews cite three key factors contributing to faster growth in demand for college graduates than for those less well-educated: shifting industry mix; increased international trade, especially with less developed nations; and technological changes that raise the productivity of more skilled workers relative to less skilled.

Overall wage inequality rose because disparities grew not only between educational groups, but also between experience (or age) categories, and even among workers with similar experience and education. Along with the causes of the growing educational wage premium, institutional factors, such as the changing role of unions and a declining real minimum wage, are thought to have contributed to greater earnings inequality.

Industry mix. Shifts in industry mix, notably the loss of manufacturing jobs and growth in services industries, have received considerable public attention although the economics research does not assign them great importance in explaining growing wage inequality.[8] Part of the reason for the public attention is that plant closings and layoffs in the manufacturing sector have been quite visible in specific local labor markets, and the associated disruptions to the work lives of individual workers have not been evenly spread among the population.

People often characterize the lost manufacturing jobs as "good" jobs, with relatively high pay and substantial fringe benefits, while services and retail trade jobs—the largest component of the nonmanufacturing additions—are considered "bad" jobs, with low pay and few fringe benefits. In fact, services and retail trade differ in their earnings profiles, with trade concentrated at the low end of the earnings distribution while services workers are more spread out at both the bottom and the top of the earnings distribution than manufacturing.[9] Thus, as workers shifted, on net, out

[8] Most studies find changes in industry mix to be a contributing factor, but a small one. The simplest evidence that the role of industry mix shifts is limited is the fact that wage inequality has expanded substantially *within* virtually all industry categories.

[9] For those working full-time and all year, earnings inequality is higher in services and retail trade than in manufacturing. The 90th/10th ratio was 3.5 for manufacturing workers in 1973 as compared with 5.2 in retail trade and 4.8 in services; by 1994, the ratios had risen to 4.7 in manufacturing, 5.5 in retail, and 5.6 in services. In both 1973 and 1994, the 10th percentile worker in retail trade had lower earnings than in services, and both earned less than the 10th percentile worker in manufacturing. The 90th percentile worker in services earned more in 1973 than the 90th percentile worker in manufacturing, but this was not the case in later years; the services worker earned slightly less.

The Educational Wage Premium

The table documents the size of the earnings premium garnered by college graduates compared with high school graduates and those not completing high school. For example, the median full-time, full-year male worker with a college degree earned 32 percent more than the median high school graduate working full-time all year in 1979, and 53 percent more than the median high school dropout holding a full-time year-round job. By 1994, those differences had risen to 71 percent and 171 percent, respectively. The educational wage premiums for women and for men and women combined were similar to those for men in each year.

The earnings premium for a college degree is higher when part-time and part-year workers are included (third panel in table), because less educated individuals are more likely to hold part-time or part-year jobs and thereby earn less annually on that score as well as on account of their education. This difference is particularly noticeable for women, since a greater fraction of female workers are on part-time or part-year work schedules. The premiums are even higher when nonworkers are included as well (data not shown), since less educated persons are also less likely to be working than college graduates.

The table also shows the nature of the increase in wage inequality between educational groups: Real wages declined precipitously for those without a high school degree, even those working full-time year-round, and rose or held steady for workers with a college degree or more. For men, the rise was very slight in real terms, but for women, it was sizable.

The Educational Wage Premium
Annual Earnings

Workers Age 25 to 64	Men	Women	Both
Full-Time, Full-Year (FTFY) Workers:			
Ratio: BA/no HS[a]			
1979	1.53	1.56	1.57
1989	1.74	1.72	1.75
1994	2.71	2.75	2.67
1979–94 Change	+1.17	+1.19	+1.10
Ratio: BA/HS[a]			
1979	1.32	1.41	1.48
1989	1.60	1.67	1.68
1994	1.71	1.74	1.73
1979–94 Change	+.39	+.32	+.25
All Workers:			
Ratio: BA/HS			
1979	1.35	1.60	1.64
1989	1.69	1.92	1.76
1994	1.68	2.00	1.84
1979–94 Change	+.33	+.40	+.20
Percent Change in FTFY Median Real Earnings, 1979–94:			
no HS	−43.2	−33.4	−41.1
HS	−22.6	−4.2	−14.6
BA	.3	17.7	−.1

[a]no HS = did not complete high school; HS = high school graduate with no college; BA = college degree or higher.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1980, March 1990, March 1995.

of manufacturing and into services jobs, the overall earnings distribution would be expected to become more unequal. A shift toward retail trade jobs would increase the weight at the bottom of the distribution.

However, the earnings distributions within each major industry also became more unequal during the 1980s. And while the manufacturing and services industries' earnings distributions both became more unequal, they were less different from one another in 1994 than they had been in 1973.[10] Both of these changes reduce the link between the tilt away from manufacturing and the rise in inequality.

Part-time and part-year work. Most analyses of earnings inequality focus on full-time, full-year workers because the inclusion of part-time or part-year workers, especially when earnings are measured on an annual basis, mixes together changes (or differences) in work schedules with changes in rates of pay. Yet in considering how individual earnings inequality may translate into family income inequality, these work schedule differences are also relevant.

[10] See Schweitzer and Dupuy (1995) for a careful analysis of this convergence.

Variations in work schedules make the earnings distribution for part-time or part-year workers considerably more unequal than the full-time, full-year distribution. Earnings inequality in 1973 and 1979 was over four times greater for men on all work schedules (working full-time or part-time, full-year or part-year) than for full-time, full-year men. Male inequality rose very slightly between 1979 and 1994. (See the lower panels of Table 1.) For women on all work schedules, by contrast, earnings inequality declined. And among all working men and women combined, inequality also declined. It was the marked shift of women into full-time, full-year work that brought inequality down.[11] The fraction of women working full-time and all year rose by 10 percentage points between 1979 and 1994 even as their numbers in the work force also increased. Men also shifted toward full-time, full-year work, but less markedly.

Family Structure and Family Work Patterns

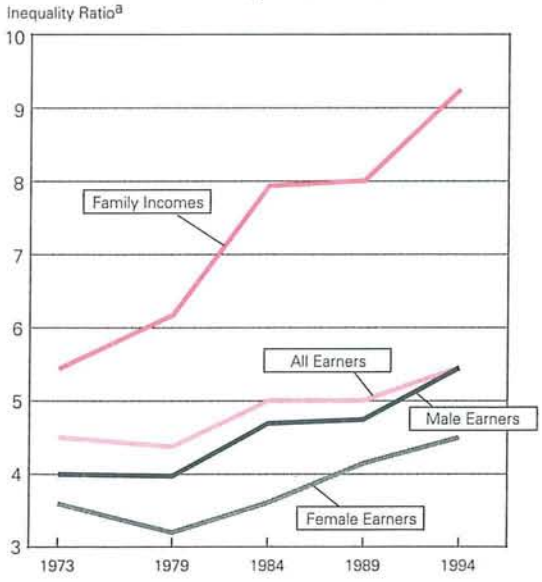
If each family had one worker and no nonearnings income, the family income distribution would match the overall distribution of earnings (for men and women on all work schedules combined). In fact, of course, some families have more than one earner and some have none. Furthermore, while earnings are the primary source, nonearnings account for about one-tenth of total family income, on average.

Figure 3 compares the inequality of family incomes with individual earnings inequality for selected years between 1973 and 1994. Two facts stand out: First, total income is distributed more unequally among families than are earnings among full-time, full-year workers. That is, the $90^{th}/10^{th}$ ratio is higher for family income than for individual earnings. Second, inequality increased considerably more among families than among individual full-time, full-year earners.[12] These facts imply that factors other than individual earnings inequality have made important contributions to family income inequality and its rise in the last two decades. The paragraphs that follow explore the characteristics of families and family earnings in terms of the individual earners.

Figure 3

Inequality of Individual Earnings and Family Incomes

Incomes of Nonelderly Families and Earnings of Full-Time, Full-Year Nonelderly Workers, Selected Years



[a] Inequality measured as ratio of 90th percentile earnings or income to 10th percentile.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, March 1980, March 1985, March 1990, and March 1995.

The most important distinction among family types from an income-generating point of view is between those headed by a married couple and those headed by an individual with no spouse present (either the head has no spouse or the spouse is absent).[13] The mix of such families has shifted consid-

[11] Looking at all work schedules, the ratio of 90^{th} percentile earnings to 10^{th} percentile earnings is quite high (as can be seen in Table 1), mostly because the 10^{th} percentile worker earns relatively little. Part-time or part-year workers typically have lower hourly earnings than full-time, full-year workers, and their lower hours and/or weeks mean that their annual earnings are even lower. Using the ratio of 80^{th} percentile earnings to 20^{th} percentile earnings reduces the sensitivity of the measure to very low part-time or part-year earnings at the bottom; but even using this measure, inequality rose for men and fell for women and for both genders combined.

[12] And much much more than among earners on all work schedules since, as just noted, earnings inequality did not increase at all for this group—it declined. Among the three full-time, full-year earnings inequality measures shown in Figure 3, the male measure most closely tracks the slopes, timing, and magnitude of changes in family income inequality. While full-time, full-year men comprise only three-eighths of all workers, over three-fifths of all families in 1994 included a full-time, full-year male worker.

[13] This section discusses family income as a function of work patterns within families, ignoring the nonearnings component of family income. Differences in family structure and the number and work schedules of family earners turn out to be much more important than variations in nonearnings income in understanding the rise in family income inequality as well as in explaining Figure 3's differences between inequality trends for family incomes and individual earnings. The nonearnings component of family income is discussed below.

erably in the last two decades. Married-couple families comprised 86 percent of all nonelderly families in 1973, but only 76 percent by 1994.[14]

Married-couple families typically have higher incomes than "one-head" families. The average income of married-couple families was $47,100 in 1973, while one-head families averaged roughly half that much—$24,500. Thus, the shift toward one-head families would cause a drop in average family income, other things equal. But other things were not equal: The average real income of married-couple families rose over the 21 years to $54,500, while the average income of one-head families declined slightly to $24,200. These changes in average incomes, combined with the shift toward one-head families, add weight to both ends of the income distribution; that is, they increase inequality.

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The rise in married couples' incomes is partly attributable to widely recognized changes in work patterns in married-couple families. The fraction of married-couple families in which both the husband and wife worked rose from 55 percent in 1973 to 70 percent in 1994, while the fraction in which the husband or wife (but not both) was working declined from 42 to 26 percent.[15] Furthermore, this rise in two-earner couples has not occurred evenly across the income distribution; it has been more pronounced in families in which the husband's earnings are higher.[16]

Not surprisingly, the incomes of two-earner married-couple families generally exceed those of one-earner married-couple families.[17] While a sizable portion of the gain in married-couple family incomes was attributable to the shift toward families in which husband and wife were both working, the incomes of two-earner couples also increased noticeably relative to other married-couple families over the 1973–94 period.[18]

The data in Figure 4 illustrate the importance of work patterns in the determination of family income. In 1994, families in which both the husband and wife worked (shown in the left-most box; the key to data items is outside the top box) reaped the earnings from about 70 percent more work hours per year than families in which only one or the other worked (the adjacent box). Differences in the number of work hours are partially offset, however, by higher hourly earnings for workers in one-earner married-couple families.[19]

Hourly earnings, more than work hours, are the crucial determinant of income differences between one-head families in which the head works and married-couple families. The family work hours of one-head families with the head working are similar to those of one-earner married-couple families (Figure 4 again). But these one-head families average less than 65 percent of the family income (and family earnings, data not shown) of one-earner married-couple families because heads of families with no spouse command considerably lower hourly earnings than the working husband or wife in married-couple families.

[14] Throughout this research, data drawn from the U.S. Current Population Survey—reporting incomes for a calendar year and demographic characteristics as of the following March—are referred to as if the demographic data also referred to the calendar year. The text sentence to which this footnote is attached, for example, actually reports on the mix of family types in March 1974 and March 1995.

[15] The fraction of married-couple families in which neither head nor spouse worked rose from 3 percent in 1973 to 4 percent in 1994.

[16] See Cancian, Danziger, and Gottschalk (1993).

[17] The "two-earner" and "one-earner" labels are used henceforth as shorthand for husband-and-wife-working and husband-or-wife-working married-couple families, respectively. The characterization is actually inaccurate, however, since husband-and-wife-working families averaged 2.3 to 2.4 workers (depending on year) and husband-or-wife-working ("one-earner") families averaged 1.3 to 1.4 workers. These additional workers are typically the couple's working-age children.

[18] The combined effect of these two changes is indicated by the fact that in 1973, 60 percent of the families in the top quintile were married-couple families with husband and wife both working; in 1994, that figure was 78 percent. This rise occurred despite the declining share of married couples among nonelderly families overall. Note that each quintile, by definition, includes one-fifth of all nonelderly families ranked by income.

[19] Hourly earnings are defined as total family earned income divided by total family work hours (the sum of annual work hours of all workers in the family). The higher hourly earnings in one-earner families are not exogenous, of course: The decision to send the second spouse into the labor market reflects, in many cases, the earnings opportunities of the "primary" earner; and even high-earning primary earners may have the family's average earnings per hour pulled down by a lower-earning second earner.

Figure 4

Income Characteristics by Type of Family, 1994

All families with nonelderly head

Key	
• Number in thousands (share (%) of all)	58,746 (100.0)
• 1973-94 change in share	n.a.
• % in lowest income quintile~highest	20 ~ 20
• Average # of members, # of workers	3.3, 1.8
• Percent with children	62
• Average annual family work hours	3,200
• Average family income ($)	47,300
• 1973-94 income change (%)	+7.8

Married-couple families

	44,639 (76.0)
	-9.6
	11 ~ 25
	3.4, 1.9
	58
	3,600
	54,500
	+15.8

Husband and wife work

31,338 (70.2)[a]	
+15.3[a]	
5 ~ 29	
3.4, 2.3	
59	
4,200	
60,300	
+19.8	

Husband or wife works

11,419 (25.6)[a]	
-16.9[a]	
19 ~ 17	
3.6, 1.3	
60	
2,400	
44,100	
-.9	

Neither husband nor wife works

	Other adult works
	318 (.7)[a]
	+0.2[a]
	30 ~ 7
	4.1, 1.2
	38
	1,800
	33,000
	+2.4

	No adult works
	1,563 (3.5)[a]
	+1.5[a]
	61 ~ 4
	2.8, 0
	29
	0
	20,000
	+23.4

One-head families

	14,107 (24.0)
	+9.6
	49 ~ 4
	2.9, 1.2
	75
	1,900
	24,200
	-1.0

Head works

10,855 (77.0)[b]	
+4.9[b]	
39 ~ 5	
2.8, 1.5	
74	
2,400	
28,200	
-1.1	

Head does not work

	Other adult works
	777 (5.5)[b]
	-3.5[b]
	52 ~ 3
	3.7, 1.2
	55
	1,600
	22,100
	+2.4

	No adult works
	2,475 (17.5)[b]
	-1.4[b]
	94 ~ 0
	3.2, 0
	89
	0
	7,200
	-29.5

Note: hours and income rounded to nearest 100; demographic characteristics as of March 1995.

[a]Percent of married-couple families (or change in that percentage).
[b]Percent of one-head families (or change in that percentage).

Source: Author's calculations based on U.S. Census Bureau, *Current Population Survey*, March 1995.

Table 2
Educational Attainment, 1994
By income quintile and family type

Family Income Quintile	Percent Who Graduated from High School			Percent Who Graduated from College		
	Husbands	Wives	Female Heads[a]	Husbands	Wives	Female Heads[a]
Poorest	60	64	58	10	8	3
Second	78	80	68	11	9	8
Middle	87	89	67	17	15	17
Fourth	92	94	60	31	27	21
Richest	92	96	54	53	45	22
All	85	88	62	28	23	9

[a]Female head of family, no husband present; over four-fifths of one-head families are headed by a woman. Income in 1994; other characteristics as of March 1995.
Source: Author's calculations from U.S. Bureau of the Census, *Current Population Survey*, March 1995.

Married-couple families with one spouse working are a mixture of those whose primary worker's earnings are high enough that the spouse can "afford" not to work, those who choose to have one spouse at home taking care of children or other obligations, and those whose spouse has such poor labor market prospects that his or her earnings would not offset the costs of going to work. But one-head families, by definition, cannot choose the best earner among two spouses. Furthermore, most (over 80 percent) family heads with no spouse present are women. They typically have less education, fewer skills, and less work experience than the working spouse (male or female) in one-earner married-couple families. Table 2 shows markedly lower educational attainment for female heads of families with no spouse present than for husbands or wives in married-couple families.[20]

Most one-head families are in the lower income quintiles. Those who do make it into the upper quintiles have similar numbers of workers to married-couple families in those quintiles (Table 3). That is, additional workers contribute the earnings that put families higher on the income scale, but very few one-head families have those additional workers.

As noted earlier, the average income of one-head families declined in real terms between 1973 and 1994. This loss was not attributable to a decline in the fraction with the head working; that fraction actually rose. Work hours also rose.[21] The loss was, instead, attributable to declining hourly wages for working family heads with no spouse present. Since these heads are mostly women and real wages for most women, unlike most men, rose over the period, the decline is undoubtedly associated with the low education levels shown in Table 2, which put most single heads on the losing side of the rising educational wage premium.

The relative importance of differences in work patterns, work effort, and earning power is revealed in Table 4. When the data are summarized by quintile (combining all family types), they indicate that differences in all three factors contribute to the income differences that define the quintiles. The more than 14-to-1 ratio of top-quintile to bottom-quintile annual family earnings is the product of disparities in hourly earnings, number of workers, and hours per worker. The hourly earnings differences are most marked, with workers in top-quintile families averaging over four times the hourly earnings of those in the bottom quintile.[22]

Furthermore, the increase in disparity between earnings in the top and bottom quintiles is attributable to increasing disparities in all three factors.[23] That is, the number of workers per family, hours per worker, and real earnings per hour all fell for the poorest quintile relative to the richest quintile during the 1980s and 1990s. Hourly earnings showed the greatest difference in growth rates between rich and poor families over the period, but all three gaps expanded.

In sum, shifts in the mix of families combined with changes in the earnings and hours of workers in various types of families to raise family income inequality over the period 1973 to 1994. Two-earner married-couple families and one-head families both increased as a share of all families. The incomes of

[20] While it may seem puzzling that the average high school graduation rates of female heads are not higher in high-income quintiles, note that data in Table 3 indicate that workers other than the head, whose education levels are not shown, account for increasing shares of income in higher quintiles.

[21] This statement applies to the 1979–94 period; hours are not reported in a comparable way for 1973. Appendix C (Figure C) reports Figure 4's data for 1979.

[22] Differences in hourly earnings also make bigger contributions to disparities between top and middle, middle and bottom, and fourth and second quintiles than the other two factors.

[23] This statement applies to the 1979–94 period. The calculation cannot be done for 1973 because hours data are not reported in a comparable way. Appendix C (Table C) reports Table 4's data for 1979.

Table 3
Number of Workers, 1994
By income quintile and family type

Family Income Quintile	Percent of Families: Married-Couple Families	Percent of Families: One-Head Families	Average Number of Workers in Family: Married-Couple Families	Average Number of Workers in Family: One-Head Families
Poorest	8.1	11.9	1.2	.8
Second	14.1	5.9	1.7	1.4
Middle	16.6	3.5	1.9	1.7
Fourth	18.1	1.8	2.1	1.9
Richest	19.1	.9	2.3	2.1
All	76.0	24.0	1.9	1.2

Note: Family type as of March 1995; income and number of workers in calendar year 1994.
Source: Author's calculations from U.S. Bureau of the Census, *Current Population Survey*, March 1995.

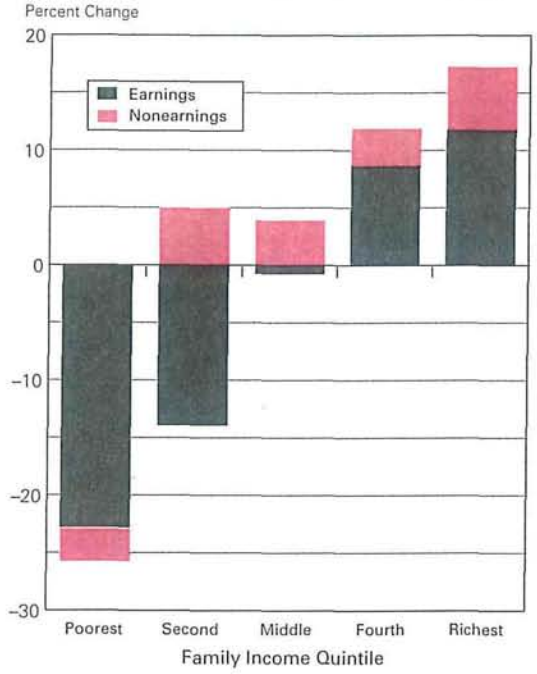
the former are well above average and the latter well below average because of differences in number of workers in the family (by definition), work hours per family worker, and earnings per family work hour. Hence the shift in mix raised inequality, other things equal. Compounding the shift is the fact that the incomes of two-earner married-couple families grew faster than those of one-head families, largely because of different growth rates in their hourly earnings. This

Table 4
Family Work Characteristics by Income Quintile, 1994

Family Income Quintile	Average Annual Family Earnings	Average Number of Family Workers	Average Annual Hours per Worker	Average Earnings per Hour
Poorest	$ 6,250	1.0	1,380	$ 4.77
Second	21,600	1.6	1,710	7.84
Middle	36,600	1.9	1,830	10.60
Fourth	54,150	2.1	1,880	13.72
Richest	90,750	2.3	1,930	20.73
All	$41,850	1.8	1,800	$13.21
Ratio: Highest to Lowest	14.5	2.4	1.4	4.3

Note: Average annual family earnings rounded to nearest $50; average hours rounded to nearest 10.
Source: Author's calculations from U.S. Bureau of the Census, *Current Population Survey*, March 1995.

Figure 5
Changes in Family Income, 1973 to 1994
Changes Attributable to Earnings and Nonearnings, by Quintile



Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974 and March 1995.

difference, in turn, presumably reflects differences in their initial earnings levels and the rising inequality of hourly earnings in the economy as a whole—declines for individual earners at the bottom and growth at the top.[24]

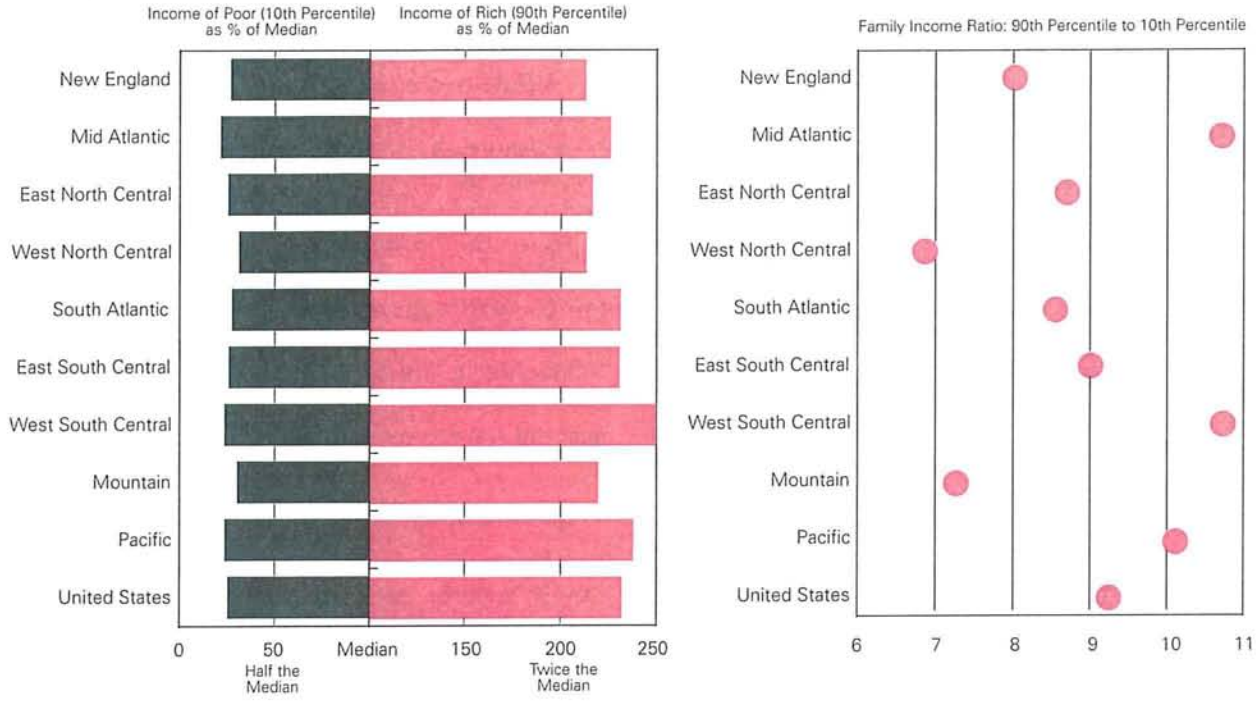
Nonearnings Income

The analysis to this point has focused on work patterns because earnings are by far the largest source of family income, comprising 88 to 92 percent of total family income (depending on the year). But as can be seen in Figure 5, changes in income other than earnings generally reinforced the growing earnings disparities between the richest and poorest families. Nonearnings income declined in real terms for the

[24] The rising educational wage premium that underlies a large part of the rise in wage inequality presumably explains some of these differences among family types in the growth rate of earnings. As Table 2 documents, heads with no spouse present have much lower educational attainment, on average, than either spouse in married-couple families.

Figure 6

Income Gap between Rich and Poor, 1994



See Table 5 for region definitions.
Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1995.

lowest income quintile and rose for the four higher quintiles.

The Census identifies two types of earnings (wage and salary income and self-employment income) and four broad types of nonearnings income—property income (including interest, dividends, and rental income), retirement income, transfer income, and "other" income. Wages and salaries accounted for 82 to 83 percent of income and self-employment averaged over 6 percent. The other sources each comprised 2 to 4 percent of total income. The importance of retirement and property income grew over the two decades (even though the families included here were headed by individuals under age 65) and transfers shrank.

Low-income families had a noticeably different mix of income sources than high-income families. The fraction of income from earnings is lowest for the poorest quintile (although still greater than 60 percent). Transfers (and retirement income) are more important in the bottom quintile than for families further up the income ladder. Transfers comprised a larger share of the poorest quintile's family income in 1994 than in 1973 (rising from 19 to 22 percent), even though the poorest quintile's average transfer income actually dropped 15 percent in real terms (that is, corrected for inflation).[25] Families in the poorest quintile experienced real declines in all sources of family income over the 1973–94 period.

II. Regional Differences in Family Income Inequality

While national business cycles and structural changes in the economy and in family organization affected all regions of the country, their magnitude

[25] Earnings, property income, and retirement income all declined faster, in real terms, for the poorest quintile than did transfers, so the transfer share rose.

Table 5
Bureau of the Census Definitions of U.S. Regions

New England (NE): Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
Middle Atlantic (MA): New Jersey, New York, Pennsylvania
East North Central (ENC): Illinois, Indiana, Michigan, Ohio, Wisconsin
West North Central (WNC): Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
South Atlantic (SA): Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia
East South Central (ESC): Alabama, Kentucky, Mississippi, Tennessee
West South Central (WSC): Arkansas, Louisiana, Oklahoma, Texas
Mountain (MTN): Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
Pacific (PAC): Alaska, California, Hawaii, Oregon, Washington

and impact on the income distribution differed. The extent of family income inequality varied noticeably among the regions in 1994. The right side of Figure 6 indicates that the greatest degree of inequality was present in the West South Central, Middle Atlantic, and Pacific regions, where rich (90th percentile) families had over 10 times as much income as poor (10th percentile) families. (See Table 5 for a list of states in each region.) The distribution was least unequal in the West North Central and Mountain regions, in which the rich/poor ratio was around 7-to-1.

The left side of Figure 6 shows the poor family's income in each region relative to the region's median income, and the rich family's income relative to the median. The "leaders" in inequality, the West South Central, Middle Atlantic, and Pacific regions, had large spreads at both the top and bottom of their income distributions—the 10th percentile family had less than one-quarter of the income of the median family, while the 90th percentile family had 2¼ to 2½ times the income of the median family. The 90th/10th ratio measure of inequality is especially sensitive to differences at the bottom, and what distinguishes the low-inequality Mountain and West North Central regions is that the 10th percentile family had about 30 percent of the median family's income.

While inequality rose in all regions, their relative rankings were not entirely stable. Figure 7 summarizes the evolution of nonelderly family income inequality in the nine regions over roughly five-year intervals from 1973 to 1994. Inequality increased in most of the regions in most of the periods shown in the chart (the major exception being the mid to late 1980s), and the increases were due predominantly to a deterioration in the incomes of poor families relative to the median in their region.

While some of the regions' relative rankings moved over time, the picture in Figure 7 is not one of widespread reversals of inequality rankings. Thus, for example, the New England, West North Central, and Mountain regions retained relatively low inequality over the entire period, while the Pacific, West South Central, and East South Central regions were fairly consistently at the high end. The next section compares the inequality of family incomes with wage inequality in the regions, and the following section discusses some of the economic factors that might account for these regional patterns.

Wage Inequality among the Regions

Figure 8 compares levels of wage inequality and family income inequality among the nine regions and the United States in selected years. The scatterplot shows a fairly strong positive association—region-years with higher wage inequality typically show higher family income inequality as well. Some of the association simply reflects the fact that both types of inequality rose over time. Nonetheless, all the points do not fall on a line, so factors other than wage inequality contribute to the inequality of family incomes.

Figure 9 plots the time patterns of wage and family income inequality for four regions: New England, Pacific, Mid-Atlantic, and East South Central. Each region's level and pattern of year-to-year changes in wage inequality are roughly, but far from exactly, reflected in family income inequality.

The Regional Economies

In considering how regional economic performance might be associated with regional inequality, economists can draw on two bodies of research relating national economic performance to inequality: studies of inequality over the business cycle and studies of inequality differences among nations at different stages of economic development. This latter research asks whether economic growth and inequality are complementary or competitive. The debate often traces its roots to Kuznets (1955), who argued

Figure 7

Family Income Inequality by Region, 1973 to 1994, Selected Years

See Table 5 for region definitions.

[a] Inequality measured as ratio of 90th percentile family income to 10th percentile.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, March 1980, March 1985, March 1990, and March 1995.

that inequality rises at the early stages of economic development and industrialization, and falls only later as growth continues. More recently, a consensus seems to have developed on the facts (which are inconsistent with Kuznets' hypothesis): In a broad cross section of nations, greater economic growth is associated with lower inequality. The mechanisms that underlie this association, and even the direction of causation, are still hotly debated, however. (See, for example, articles by Albelda and Tilly 1995; Birdsall, Ross, and Sabot 1995; and Chang 1994.)

Most U.S. regions' economic fortunes are linked to national business cycles. Local manufacturers sell their products in national and international markets, and other local businesses and consumers are affected by nationwide factors such as interest rates and exchange rates. Nonetheless, regions do not move in lockstep with the nation. Occasionally a region will experience a recession or boom that does not mirror the national cycle. More frequently, the timing and amplitude of the cycle will differ among the regions.

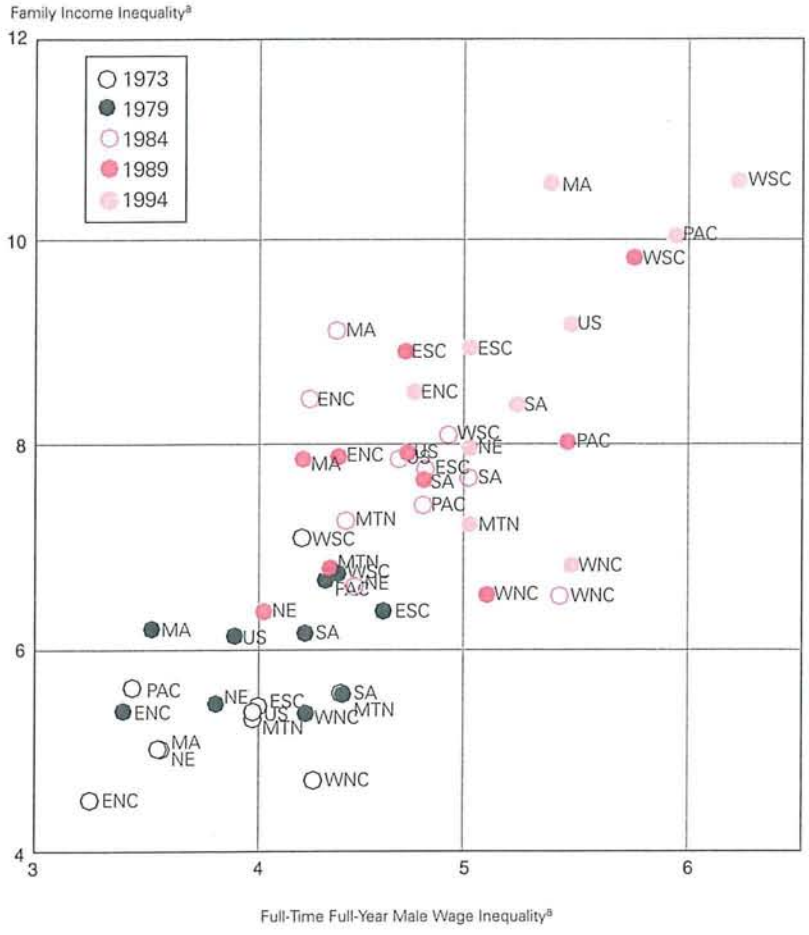
For example, while the country as a whole did not see falling inequality during the 1980s expansion, the experience of New England as compared with other regions is consistent with the "typical" cyclical pattern. New England experienced an economic boom of unusual proportions, enjoying unemployment rates in the 3 to 4 percent range in the late 1980s while the national rate was running at 5 to 6 percent. Although income inequality rose in all regions during the 1980s, it rose least in New England. Indeed, New England was the only one of the nine Census divisions in which the income of the 10th percentile family rose in real terms between 1979 and 1989; in the other eight regions, the income of poor families fell.

Similarly, Texas (in the West South Central region) and the other oil states suffered a severe economic decline while the rest of the nation expanded in the early to mid 1980s; Figure 7 shows a steep increase in inequality there between 1984 and 1989 (when inequality was declining in some other regions). The "rust belt" East North Central and Middle Atlantic states enjoyed their fastest employment growth in the 1984–89 period—initially reflecting their recovery from the severe recession of 1981–82—and simultaneously experienced declines in income inequality.

Figure 8

Inequality of Wages and Family Incomes

Scatter Plot by Region, Selected Years 1973 to 1994



[a] Inequality measured as ratio of 90th percentile income or earnings to 10th percentile.

See Table 5 for region definitions.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, March 1980, March 1985, March 1990, and March 1995.

New England's boom was followed by a downturn that began earlier and was much more severe than the national recession of 1990–91, in which the region lost one in 10 jobs and saw inequality rise noticeably. The Mountain states, by contrast, suffered virtually no employment loss in the early '90s recession and showed only a very small rise in inequality between 1989 and 1994.

These regional patterns are consistent with the hypothesis that economic growth reduces inequality while tough times are accompanied by rising inequality. When a region's pace or direction of economic growth and decline does not match the national cycle, the relative degree of inequality in the region often shifts accordingly.

Regions also vary considerably in their industry mix, another factor hypothesized to be associated with earnings inequality. All the regions saw a sizable downtrend in the fraction of employment in manufacturing over the past two decades. Before the recession of 1973–75, the East North Central, East South Central, and New England regions had the highest fraction of nonagricultural employment in manufacturing (30 percent or more), and the Mountain states were alone at the other extreme, with less than 15 percent. By 1994, only the East North Central and East South Central regions had more than 20 percent manufacturing jobs. The Mountain region's manufacturing share had fallen the least but remained at the low end with about 10 percent of nonfarm jobs in manufacturing.[26]

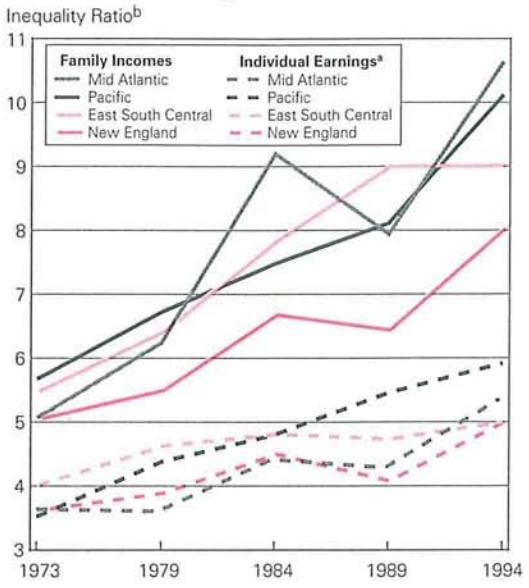
Patterns of part-time work also vary among the regions. In the nation as a whole, the fraction of workers on part-time schedules rose from 14.6 percent in 1973 to 15.3 percent in 1994. The part-time fractions in the West North Central and

[26] If industry mix were a crucial determinant of inequality, one would expect inequality to be higher in the Mountain states than in New England, the East North Central, and East South Central regions. If changes in industry mix were important, then inequality would be rising everywhere, but relatively high in New England and low in the Mountain states, East North Central, and East South Central. Figure 7, however, shows the New England and Mountain regions with consistently low inequality over the 1973–94 period, while East North Central rose from low to medium, and East South Central stayed near the middle.

Figure 9

Inequality of Family Incomes and Individual Earnings[a]

Selected Regions, Selected Years



[a] Earnings inequality measured for full-time, full-year earnings of men.

[b] Inequality measured as ratio of 90th percentile to 10th percentile.

Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, March 1980, March 1985, March 1990, and March 1995.

New England regions were consistently above the national average (over 18 percent and about 17 percent, respectively) but did not rise appreciably. The South Atlantic region's part-time fraction was below average, but also changed little, staying below 14 percent over the period.

Regional Differences in Family Structure, Work Patterns, and Income Sources

In addition to the differences in their economies outlined above, the regions have somewhat different demographic profiles, cultures, traditions, or histories that may cause their family structure and work patterns—and hence income inequality—to vary. For example, the fraction of nonelderly families headed by a single parent was highest (30 percent) in the relatively high-inequality Pacific and East South Central regions in 1994 and lowest (24 percent) in the relatively low-inequality Mountain states.

Among single-parent families, variations in family work patterns should also be associated with differences in inequality. The average number of workers in one-head families was highest in 1994 in the relatively low-inequality Mountain and West North Central regions and lowest in the relatively high-inequality Middle Atlantic states.

For some regional population characteristics, however, the relationship with family income inequality, even hypothetically, may be more complicated. The relationship between educational attainment and inequality is especially ambiguous. As discussed earlier, the premium to education reflects the interaction between the demand for educated workers and the supply, and its rise is generally attributed to faster growth in demand for college-educated workers than in their supply. Thus, if all regions faced a similar demand for educated workers, one would expect lower wage premiums and lower inequality in regions with more educated workers. However, if the demand for educated workers is higher in regions with more educated workers, as seems likely based on theories of how businesses decide where to expand or locate, the wage premium need not be lower in those regions. And to the degree that demand is increasing faster than supply, the premium to education might actually increase more rapidly in areas with more educated workers.[27] The data show the 1994 fraction of the adult population with a college degree (or more) ranging from 31 percent in relatively low-inequality New England to 18 percent in the more unequal East South Central region.

The average family's mix of income sources also varied among the regions, although not very markedly. For example, transfers as a percent of nonelderly family income varied by only 2 percentage points in 1994 from the highest region (Pacific) to the lowest (Mountain).

The next section uses multiple regression analysis to sort out and quantify the relationships between a variety of demographic and economic characteristics, on the one hand, and the degree of income inequality, on the other, both over time and among U.S. regions.

[27] A related hypothesis is more mechanical: If the national rise in the educational wage premium in the 1980s stretched out the top of the income distribution, one would expect that regions with a more educated population would have greater inequality. However, as noted in the next sentence, the college percentage is over 15 percent even in the lowest region, so increased returns to the college-educated might not be captured by the measure of inequality used here, since it reflects only the 90th and 10th income percentiles. Thus, increased returns to education might raise the incomes of the top 30 percent of families in New England and only the top 15 percent in the East South Central region; in both regions, thus, the 90th percentile's income would be higher compared to the 10th's than before the returns to education rose.

Since some of the demographic and cultural changes that are hypothesized to be causes of income inequality have moved only gradually over time and, in some cases, quite steadily in one direction, their contributions are very difficult to identify in time-series analyses of the upward trend in U.S. inequality. To the degree that they differ among regions, using regions as observations may allow some isolation of their effects.

III. Family Income Inequality: Differences over Time and among Regions

The preceding sections of this article have introduced (explicitly or implicitly) a number of hypotheses regarding causes of increased family income inequality in the United States. This section attempts to explore these hypotheses econometrically, using data on U.S. regions over the 1973–94 period. Immediately below, the data are described. The next subsection presents the econometric results and summarizes the findings regarding each group of hypotheses.

Measures of both economic prosperity and demographics and family structure seem to influence the degree of family income inequality, independent of the local degree of wage inequality.

A third subsection interprets the results, quantifying specific factors' contributions to interregional differences in inequality and to the 1973 to 1994 rise in U.S. inequality.

The Data

Measures of nonelderly family income inequality are regressed on a variety of explanatory variables using a pooled time-series, cross-section set of 90 observations: nine U.S. regions by ten years (1973, 1979, 1984, and 1988 to 1994). The regressions use data mostly drawn from the *U.S. Current Population Survey* (CPS), March Supplement, which reports demographic characteristics of families as of the survey date in March and income and work characteristics for the preceding calendar year. Table 6 reports summary statistics and sources.

Hypotheses related to the health of the local economy and economic growth are examined using measures of employment growth, unemployment rates, and median family income. Inequality-related characteristics of regional labor markets are summarized with measures of labor force participation and the prevalence of part-time work. To gauge the importance of the educational wage premium, the fraction of the adult population (age 25 and older) with a college degree is included. Industry mix is proxied by the share of employment in manufacturing.

Demographic variations among regions and over time are captured in variables tallying the fraction of (nonelderly) families headed by single parents and the fractions of the population that are black or Hispanic. Family work patterns are reflected in the average number of workers in married-couple and one-head families.

Regression Results

Table 7 reports the estimated coefficients from several equations "explaining" family income inequality, measured as the ratio of the 90th percentile nonelderly family's income to that of the 10th percentile family. Column (1) reports results for an inclusive set of economic, demographic, and family structure variables. Columns (2) through (4) try out three additional types of influences: industry mix, income composition, and wage inequality.

Table 8 examines disparities in the top and bottom of the income distribution separately, using logarithms so the results are additive. Column (1) reports an equation identical to column (1) of Table 7, except that the dependent variable is in logs. Columns (2) and (3) include the same explanatory variables but have as dependent variables the log of the 90th/50th ratio and the log of the 50th/10th ratio.

Table 9 also uses the same set of explanatory variables as column (1) of Table 7. Three alternative inequality measures are used as dependent variables: individual wage inequality as measured by the 90th/10th annual earnings ratio for full-time, full-year men; the ratio of 80th percentile family income to 20th percentile family income; and the ratio of average income in the richest quintile to average income in the poorest quintile.

Most of the variables in most of the equations shown in Tables 7 to 9 obtain coefficients that are

Table 6
Variable Means and Sources
Pooled regional cross-section time series, selected years 1973 to 1994 (N = 90)

Variable Name:	Mean	Standard Deviation	Minimum	Maximum	Source	Notes
Inequality ratio: 90th/10th	7.8	1.5	4.6	10.7	CPS	These ratios are all based on money income data for nonelderly families; selected percentiles.
Logarithm of ratio: 90th/10th	2.03	.20	1.52	2.37	CPS	
Logarithm of ratio: 90th/median	.77	.07	.61	.92	CPS	
Logarithm of ratio: median/10th	1.27	.15	.91	1.55	CPS	
Inequality ratio: 80th/20th	3.5	.5	2.5	4.5	CPS	
Quintile average income ratio: richest/poorest	9.0	1.6	5.4	12.2	CPS	Ratio of average income of richest fifth of families to poorest fifth
Wage inequality (male 90th/10th)	4.8	.6	3.3	6.2	CPS	Annual earnings, full-time, full-year men.
% change in employment from year earlier	2.6	2.2	−5.0	7.6	BLS	Nonagricultural employment
Unemployment rate previous year (%)	6.4	1.6	3.1	12.3	BLS	Unemployed/labor force, lagged
Labor force participation rate (%)	65.5	3.0	57.5	71.8	BLS	Labor force/civ. noninst. pop.
Percentage of workers part-time	15.5	1.8	12.1	19.2	CPS	
Median family income ($000)	40.3	4.8	30.3	54.8	CPS	See note on ratios above
% adults (25+) with college degree	19.9	4.6	8.5	30.5	CPS	
% families headed by single parents	25.0	4.5	12.7	32.7	CPS	
% population black	11.0	6.8	1.9	22.8	CPS	
% population Hispanic	7.7	6.9	.2	24.7	CPS	
Avg. no. of workers, married-couple families	2.0	.1	1.8	2.1	CPS	
Avg. no. of workers, one-head families	1.3	.1	1.1	1.5	CPS	
% employment in manufacturing	18.9	5.0	10.2	33.7	BLS	% of nonagricultural employment
% of income from earnings	89.0	1.2	86.9	93.6	CPS	Earnings = wages & salaries plus self-employment income

Note: CPS is U.S. Bureau of the Census, *Current Population Survey*, March, various years. BLS is U.S. Bureau of Labor Statistics, household and establishment series.

significantly different from zero and of the expected signs. The results are discussed and interpreted in the following subsections.

The economy. Most of the hypotheses related to the health and structure of the economy are supported by the data. In these equations, regions (years) in which employment expanded faster from the prior year have lower inequality, other things equal. In addition, where (or when) median family income is higher, income inequality tends to be lower, all else equal.[28] Furthermore, higher unemployment (lagged one year) is associated with greater inequality, reflecting the fact that unemployment is not spread evenly across the work force.

This uneven impact is revealed further in Table 8, where the estimated coefficients indicate that higher unemployment has no discernible effect on the spread at the top of the distribution, but is associated with greater disparities in income between middle-income families and poor families. Employment growth also has its impact on inequality through raising the bottom of the distribution relative to the median, not by raising the median relative to the top (or bringing down the top). By contrast, most of the inequality-lowering impact of a higher median income appears to work through compression of the top of the distribution rather than the bottom.[29]

When percent of employment in manufacturing

[28] Note that the income figures are adjusted for inflation using the U.S. consumer price index, but they are not corrected for regional differences in the cost of living. These differences can be substantial. For example, consumer prices rose about 10 percent more in Boston during the 1980s than in the nation as a whole. (Neither the U.S. adjustment nor regional adjustments would affect the $90^{th}/10^{th}$ percentile inequality measure because it is a ratio of two income numbers, both multiplicatively adjusted in the same way.)

[29] Since the median is the numerator of the dependent variable in column (3) of Table 8, however, it may be that the indistinguishable-from-zero impact reflects a truly inequality-lowering impact of a higher median offset by the arithmetic effect of a higher numerator in the measure. The arithmetic and inequality effects are reinforcing for the dependent variable in column (2), in which the median is the denominator.

Table 7

Regression Results – Family Income Inequality

Pooled regional cross-section time series, selected years 1973 to 1994
(Standard errors in parentheses below estimated coefficients)

	Dependent Variable			
Explanatory Variables:	Ratio: 90th/10th (1)	Ratio: 90th/10th (2)	Ratio: 90th/10th (3)	Ratio: 90th/10th (4)
Constant	3.7 (2.9)	3.6 (2.9)	−10 (8)	2.4 (2.6)
% change in employment from year earlier	−.089*** (.033)	−.087*** (.034)	−.088*** (.033)	−.090*** (.029)
Unemployment rate (%), previous year	.14*** (.04)	.13*** (.04)	.16*** (.04)	.13*** (.03)
Labor force participation rate (%)	−.21*** (.04)	−.21*** (.04)	−.22*** (.04)	−.19*** (.04)
Percentage of workers part-time	.26*** (.08)	.27*** (.08)	.25*** (.08)	.21*** (.07)
Median family income (000)	−.073*** (.025)	−.080*** (.028)	−.083*** (.025)	−.014 (.025)
% adults (25+) with college degree	.054 (.039)	.065 (.045)	.079* (.041)	.0050 (.036)
% adults (25+) with col. degree, post-1979	.044*** (.014)	.045*** (.015)	.039*** (.014)	.030** (.013)
% families headed by single parents	.12*** (.03)	.11*** (.03)	.15*** (.03)	.12*** (.03)
% population black	.12*** (.02)	.12*** (.02)	.11*** (.02)	.090*** (.021)
% population Hispanic	.12*** (.02)	.12*** (.02)	.12*** (.02)	.089*** (.015)
Avg. no. of workers, married-couple families	6.4*** (1.9)	6.5*** (1.9)	6.2*** (1.8)	4.6*** (1.7)
Avg. no. of workers, one-head families	−2.6** (1.0)	−2.7*** (1.0)	−2.1** (1.0)	−2.5*** (.9)
% of employment in manufacturing		.0095 (.019)		
% of income from earnings			.15* (.08)	
Wage inequality ratio: male earnings 90th/10th				.76*** (.16)
No. of observations	90	90	90	90
Adjusted R-squared	.90	.90	.90	.92

*Significantly different from zero with 90 percent confidence.
**Significantly different from zero with 95 percent confidence.
***Significantly different from zero with 99 percent confidence.
Source: Author's calculations; see Table 6 for variable definitions.

industries is included (Column (2) of Table 7), it fails to obtain an estimated coefficient that is significantly different from zero.[30] This lack of impact may partly reflect the fact, noted earlier, that the earnings distributions of manufacturing and services became more alike over the period. Nonetheless, despite the strong association suggested by national trends (loss of manufacturing jobs accompanied by rising inequality), this time-series cross section of regions finds no independent effect of the composition of jobs among industries on family income inequality once the other included economic and demographic variables are controlled for.

Higher labor force participation rates are also associated with lower inequality. Apparently the broader the involvement of the working-age population in the labor market, the more evenly shared are incomes. And regions (years) with more workers on part-time schedules have a more unequal income distribution because part-time workers' lower annual earnings pull down the bottom of the distribution.

Thus, the typical cyclical pattern shows up in these pooled time-series, cross-section data, as does the pattern typically found in international data. That is, prosperity (high family income, low unemployment rate, faster employment growth, more people working, and working more hours) is associated with lower inequality, other things equal. However, the economy's structural shift away from manufacturing and toward services is not part of the story.

Educational attainment. The educational wage premium also shows clearly in these data. Regions (years) with a higher fraction of the population college-educated show more inequality, other things equal. Because the earnings inequality literature finds that the educational wage premium rose in the 1980s but not the 1970s, a separate college coefficient is estimated for the years after 1979.[31] While the college coefficient is

[30] Similarly, variables measuring percent of employment in services industries or the change in either manufacturing or services' share of employment obtain coefficients that are statistically indistinguishable from zero (results not shown).

always significant different from zero in the 1980s and '90s, in most of the equations reported here, educational attainment has no significant effect in the 1970s. Reflecting the fact that worker(s) in the 10th percentile family typically are not college-educated,[32] the decomposition of inequality in Table 8 suggests that regions (years) with more college-educated residents have a higher median income and an even higher (relative to the median) 90th percentile income.

As noted earlier, the growing college wage premium reflects faster growth in the *demand* for college-educated workers than in the *supply*. As the emphasis on education rises, employers would be increasingly attracted to locate or expand in regions with a more educated work force. In this case, the coefficient would reflect proportionally greater increases in demand for educated workers (hence higher incomes for them) in regions like New England that have relatively high levels of educational attainment than in the East South Central and West South Central regions with lower attainment.[33]

Population and family characteristics. Demographic factors are strongly associated with income inequality. Inequality is higher where (when) there are more single-parent families. Inequality is also higher where the fraction of the population that is black or Hispanic is higher. All of these groups (single-parent families, black families, and Hispanic families) are typically underrepresented at the top of the income distribution. Interestingly, the decomposition in Table 8 suggests that, of these demographic variables, only the single-parent fraction has its dominant impact on inequality through pulling down the bottom of the income distribution. The other variables are associated with the spread at the top of the distribution as well as at the bottom, although the estimated coefficients for the bottom—the median/10th equation—are larger than for the top.

Table 8
Regression Results — Family Income Inequality Decomposition
Pooled regional cross-section time series, selected years 1973 to 1994
(Standard errors in parentheses below estimated coefficients)

	Dependent Variable		
Explanatory Variables:	Logarithm of Ratio: 90th/10th (1)	Logarithm of Ratio: 90th/median (2)	Logarithm of Ratio: Median/10th (3)
Constant	1.4***	.59***	.76**
	(.3)	(.15)	(.30)
% change in employment from year earlier	−.010**	.0011	−.011***
	(.004)	(.0017)	(.003)
Unemployment rate (%), previous year	.018***	.0015	.017***
	(.005)	(.0021)	(.004)
Labor force participation rate (%)	−.025***	−.0046**	−.020***
	(.005)	(.0023)	(.004)
Percentage of workers part-time	.031***	−.00085	.032***
	(.010)	(.0044)	(.009)
Median family income (000)	−.0096***	−.0079***	−.0017
	(.0029)	(.0013)	(.0026)
% adults (25+) with college degree	.0073	.0061***	.0013
	(.0046)	(.0021)	(.0041)
% adults (25+) with col. degree, post-1979	.0064***	.0019**	.0045***
	(.0017)	(.0008)	(.0015)
% families headed by single parents	.016***	.0032**	.013***
	(.003)	(.0016)	(.003)
% population black	.015***	.0036***	.012***
	(.003)	(.0012)	(.002)
% population Hispanic	.015***	.0051***	.010***
	(.002)	(.0008)	(.002)
Avg. no. of workers, married-couple families	.80***	.24**	.56***
	(.22)	(.10)	(.19)
Avg. no. of workers, one-head families	−.33***	.0094	−.34***
	(.12)	(.053)	(.11)
No. of observations	90	90	90
Adjusted R-squared	.93	.87	.89

*Significantly different from zero with 90 percent confidence.
**Significantly different from zero with 95 percent confidence.
***Significantly different from zero with 99 percent confidence.
Source: Author's calculations; see Table 6 for variable definitions.

[31] The post-1979 coefficient is additive; that is, the estimated effect of college in the 1980s to '90s is indicated by the sum of the two coefficients. When the post-1979 coefficient is significantly different from zero, it indicates that the post-1979 effect of college is significantly higher than the 1970s effect.

[32] Table 2 shows five to seven times as many college graduates in the richest quintile of families as in the poorest quintile.

[33] The more mechanical explanation is that families with college-educated workers, in any region, pull ahead of those without a

Table 9
Regression Results — Alternative Dependent Variables
Pooled regional cross-section time series, selected years 1973 to 1994
(Standard errors in parentheses below estimated coefficients)

Explanatory Variables:	Dependent Variable: Wage Inequality Ratio: Male Earnings 90th/10th (1)	80th/20th Percentile Family Income Ratio (2)	Quintile Average Family Income Ratio: Richest/Poorest (3)
Constant	1.7	2.7***	7.3**
	(1.9)	(.9)	(2.8)
% change in employment from year earlier	.0015	−.018*	−.049
	(.021)	(.010)	(.032)
Unemployment rate (%), previous year	.0087	.033***	.12***
	(.025)	(.012)	(.04)
Labor force participation rate (%)	−.025	−.040***	−.18***
	(.028)	(.013)	(.04)
Percentage of workers part-time	.072	.063**	.21**
	(.054)	(.026)	(.08)
Median family income (000)	−.078***	−.033***	−.12***
	(.016)	(.007)	(.02)
% adults (25+) with college degree	.065**	.018	.036
	(.025)	(.012)	(.038)
% adults (25+) with col. degree, post-1979	.018**	.011**	.063***
	(.009)	(.004)	(.014)
% families headed by single parents	−.0024	.039***	.12***
	(.019)	(.009)	(.03)
% population black	.041***	.032***	.11***
	(.015)	(.007)	(.02)
% population Hispanic	.043***	.035***	.11***
	(.010)	(.005)	(.02)
Avg. no. of workers, married-couple families	2.3*	.93	4.6**
	(1.2)	(.57)	(1.8)
Avg. no. of workers, one-head families	−.24	−.27	−1.4
	(.65)	(.31)	(1.0)
No. of observations	90	90	90
Adjusted R-squared	.72	.90	.92

*Significantly different from zero with 90 percent confidence.
**Significantly different from zero with 95 percent confidence.
***Significantly different from zero with 99 percent confidence.
Source: Author's calculations; see Table 6 for variable definitions.

Inequality is higher where (when) the average number of workers in married-couple families is higher and where the average number of workers in one-head families is lower. Given the data examined earlier showing that most one-head families are near the bottom of the income distribution and two-earner married-couple families are more prevalent in the middle and top, a simple interpretation would be that more work among one-head families brings up the bottom while more workers in married-couple families stretch the top of the income distribution. Table 8 tells a slightly more complicated story for married-couple families, however: More work effort by members of married-couple families stretches the bottom of the distribution, presumably by raising the median relative to the 10th percentile income, and stretches the top by raising the 90th percentile income even more.

The mix of income sources barely influences the degree of family income inequality. Column (3) of Table 7 reports a version of the equation that includes the fraction of income from earnings. The coefficient is positive (regions or years in which earnings comprise a greater share of family income tend to have higher inequality, other things equal), but significantly different from zero at only the 10 percent level. Other measures of income mix show no relationship with inequality.

The final column of Table 7 reports an equation that adds wage inequality to the list of variables. While this equation is an interesting descriptive exercise, the usual caveats regarding causative interpretations for estimated coefficients apply with particular force here. The most striking result, however, is how little the other coefficient estimates are affected by the inclusion of wage inequality (measured among full-time, full-year male workers), given that many of the explanatory variables would be expected to have their effects on family income inequality by affecting wage inequality. While the coefficients on a number of variables are somewhat smaller in column (4) than in column (1), the only coefficient that falls to zero is the one on median family income. Thus, measures of both economic prosperity and demographics and family structure seem to influence the degree of family in-

college degree and stretch out the distribution in proportion to their fraction of the population.

come inequality, independent of the local degree of wage inequality.

An equation with wage inequality as its dependent variable might be expected to shed further light on which factors' effects on family income inequality occur mostly through their effects on wage inequality, but the results (shown in column (1) of Table 9) are somewhat surprising. The estimates indicate that most of the economic factors (employment growth, lagged unemployment, labor force participation, and part-time work) are not associated with wage inequality, while one of the family variables is (workers in married-couple families).[34] In addition to these unexpected findings, the equation does confirm a rising college wage premium (the college coefficient is significantly higher after 1979 than before), as well as greater wage inequality in regions with a higher percentage black or Hispanic population, and higher median income, other things equal.

The two most important factors associated with the observed rise in U.S. income inequality from 1973 to 1994 were the increasing fraction of families headed by single parents and the rising payoff to college education in the 1980s.

The alternative measures of family income inequality used as dependent variables in Table 9 produce results that are very similar to those for the basic family inequality measure used in Table 7. Column (2) of Table 9 uses the ratio of the 80th percentile family income to the 20th percentile family; column (3) has the ratio of average income in the richest quintile to average income in the poorest quintile. The similarity of coefficient patterns is not surprising since all three ratios moved similarly over the 1973–94 period (see Appendix A for a comparison of the measures). The employment growth coefficient is noticeably weaker in the 80th/20th equation than in the 90th/10th, and becomes indistinguishable from zero in column (3). Among the other variables, a number of the estimated coefficients are slightly weaker with the alternative inequality measures, but only the coefficients on number of workers in one-head families fall to zero.

Interpretation of Results

One way to understand what the regressions imply about inequality is to use the coefficient estimates to "explain" inequality differences among regions or the observed rise in U.S. inequality from 1973 to 1994. Multiplying actual variable values in a specific year or region by the estimated coefficients shown in column (1) of Table 7 provides a "prediction" of the inequality ratio for that year or region. Comparing those predictions over time or across regions allows the predicted change (or difference) in inequality to be associated with changes (or differences) in specific factors.

Nationally, the ratio of 90th percentile income to 10th percentile income rose by 3.8 (from 5.4 to 9.2) between 1973 and 1994. The predicted value (based on U.S. variable values) rose by almost as much (3.5). The two most important factors associated with the rise were the increasing fraction of U.S. families headed by single parents and the rising payoff to college education in the 1980s (see the first panel of Table 10).[35] An expansion in the Hispanic fraction of the population was also a factor, as was the rising number of workers in the average married-couple family. Changes in the economy (employment growth was slower and the unemployment rate and part-time fractions were higher in 1994 than in 1973) also contributed to the rise in inequality, but to a lesser extent, and so did a slight

[34] Since the wage inequality measure is for full-time, full-year workers, the zero effect of labor force participation and part-time work is not surprising—those variables determine whether or not a worker is considered full-time, full-year.

[35] Wage inequality also rose over the 1973–94 period, but separating out the direct effect of rising wage inequality does not change the nature of these results. If the figures in Table 10 were computed using the coefficients from the equation including wage inequality (column (4) of Table 7 instead of column (1)), the "college" contribution would be 0.7 instead of 1.6; the direct contribution of changes in the wage inequality variable is 1.1; the other estimates are essentially unchanged. Thus, the effect of the rise in single parenting on family income inequality is virtually the same whether or not wage inequality is included in the equation, consistent with the expectation that family structure would affect family income inequality but not the distribution of wages. College education, by contrast, known to have contributed substantially to the rise in wage inequality, makes a smaller independent addition to family income inequality once wage inequality's effect is removed. And when included, the increase in wage inequality itself (presumably including whatever part of that increase is attributable to the growing college premium) is the second most important factor associated with rising family inequality.

Table 10
Major Factors in Family Income Inequality

	Difference or Change in Inequality Ratio
I. Trend: Increase in U.S. family income inequality, 1973–94	
Actual	+3.8
Predicted (fitted value of regression)	+3.5
Estimated contribution of 1973–94 actual U.S. increase in:	
% families headed by single parents	+1.5
% adults (25+) with college degree[a]	+1.6
% population Hispanic	+.6
Avg. no. of workers, married-couple families	+.3
Labor force participation rate	−1.3
II. Cycle: Increase in U.S. family income inequality, 1990–92	
Actual	+.6
Predicted	+.6
Estimated contribution of 1990–92 actual U.S. change in:	
Employment growth	+.1
Unemployment rate (lagged one year)	+.2
III. Regional level: Difference between New England average and all-regions average	
Actual	−1.0
Predicted	−1.0
Estimated contribution of difference between New England and all regions in:	
% population black	−.9
Median family income	−.6
Labor force participation rate	−.5
% population Hispanic	−.5
Avg. no. of workers, married-couple families	+.8
% adults (25+) with college degree[a]	+.5
% of workers part-time	+.4
IV. Regional boom: Decrease in New England inequality, 1984–89	
Actual	−.3
Predicted	−1.5
Estimated contribution of 1984–89 actual New England change in:	
Median family income	−.7
Unemployment rate (lagged one year)	−.5
Labor force participation rate	−.4
Avg. no. workers, one-head families	−.3
% families headed by single parents	−.3
V. Regional bust: Increase in New England inequality, 1989–94	
Actual	+1.6
Predicted	+2.7
Estimated contribution of 1989–94 actual New England change in:	
Median family income	+.4
Unemployment rate (lagged one year)	+.5
Labor force participation rate	+.2
Avg. no. workers, one-head families	+.8
% families headed by single parents	+.7

[a]College "contribution" reflects both rise in fraction with college and rising return to college (higher estimated college coefficient after 1979).

Note: Inequality measured as ratio of 90th percentile income to 10th. "Contributions" are based on coefficients reported in Table 7, column (1).

Source: Author's calculations; see Table 6 for variable definitions.

decline in the average number of workers in one-head families and a small rise in the black fraction of the population.[36] Over this period, the overall labor force participation rate rose; in the absence of this improvement, family income inequality in the United States would have risen even more than it did.

The factors the equations identify as most important in explaining the two-decade rise in inequality are, not surprisingly, trend variables—increases in single-parenthood and college graduation rates have cumulated over a relatively long time period. But other variables may be more important in explaining interregional or year-to-year variations in inequality. For example, both employment growth and the unemployment rate move considerably over the business cycle, but were only marginally less favorable in 1994 (an expansion year) than in 1973 (a pre-recession peak). The rise in unemployment and decline in employment growth that occurred during the 1990–91 recession, however, accounted for about one-half of the increase in inequality that occurred between 1990 and 1992 (see second panel in Table 10).[37]

Across all the regions, the greatest variations in inequality are attributable to interregional differences in racial and ethnic mix, the prevalence of part-time work, and labor force participation in general and especially among married-couple families.[38] The estimated coefficients indicate, for example, that New England's comparatively low family in-

[36] These factors making smaller estimated contributions—about 0.2 each—are not shown in Table 10.

[37] U.S. employment grew 1.4 percent in 1990 and only 0.3 percent in 1992; the nation's unemployment rate rose from 5.3 percent in 1989 (recall that unemployment is lagged one year in the regression) to 6.7 percent in 1991.

[38] Differences between the highest and lowest region in either 1973 or 1994 on each of the listed variables "explains" a difference in the inequality ratio of more than 1.0. In the 1980s and '90s (but not the '70s), interregional differences in median family income and college degrees also made contributions this large.

come inequality over the entire 1973–94 period was associated with a number of factors, including its above-average median income and labor force participation, along with below-average fractions of black and Hispanic population. (See the third panel of Table 10.) Partially offsetting these factors were more workers in married-couple families, a higher percentage of college graduates than the average region, and a higher fraction of part-time workers.

The estimated coefficients can also be used to explore why New England's relative inequality fell during its economic boom and rose during the recent recession (see the final two panels of Table 10). The drop during the region's mid to late-1980s boom was associated with improvements in the economy (income rose and unemployment fell between 1984 and 1989), a rise in the region's overall labor force participation rate with an associated increase in the number of workers in one-head families, and a decline in the fraction of single-parent families. Most of these improvements unraveled in the ensuing bust: The region experienced higher unemployment, lower real family incomes, an increase in the fraction of families headed by single parents, and a decline in the average number of workers in one-head families, all of which were associated with the rise in inequality between 1989 and 1994.

IV. Conclusions

Both economic and demographic factors have contributed to increased family income inequality in the 1970s, '80s, and '90s. According to the estimated equations, the most important factors associated with the two-decade rise in inequality are a rising fraction of single-parent families and an increase in the payoff to college education, offset by swelling labor force participation. Also contributing was a rise in the number of workers in married-couple families. Year-to-year variations were attributable, in addition, to year-to-year changes in rates of employment growth and unemployment. Inequality differences among regions are explained by those factors plus sizable differences in racial and ethnic composition and labor market characteristics such as the prevalence of part-time work and labor force participation rates.[39]

[39] This choice of "most important" factors is based on the "predicted value" exercise for the United States reported in the previous section and on the size of estimated beta coefficients associated with the equations shown in Tables 7 to 9.

Empirical analyses such as those reported here capture relationships that may or may not reflect causation. Lacking a causal connection, if policies were to be directed at moderating or reversing this rise in inequality, those aimed at improving economic growth and facilitating and encouraging wide participation in the labor market (if such participation can be successful, not adding mostly to unemployment) would seem most promising. That is, boosting employment growth and labor force participation and reducing unemployment and (involuntary) part-time work are likely to raise the incomes of the poorest families, incomes that declined markedly in real terms over the last two decades. Furthermore, even if such efforts were not successful in reducing inequality, enhancing and steadying economic growth and tapping available human resources more effectively through greater access and education would have other salutary effects on the economy.

The payoff in terms of reduced inequality is likely to be large to any efforts that increase the employability and productivity of those currently at the bottom of the income distribution.

The demographic factors identified as important, by contrast, are not appropriately subject to policy pushes. No one would suggest reducing the number of workers in married-couple families as a method of reducing inequality. Rather, any policies undertaken might be aimed at changing the relationship between these population composition characteristics and income inequality. For example, the association between single parenthood and racial and ethnic composition, on the one hand, and income inequality, on the other, might be altered through improvements in the functioning of the economy and through policies targeted on encouraging work among families currently attached only marginally to the labor force. That is, with greater prosperity and better returns to work—stronger economic growth and broader (successful) participation in the labor market—more single-parent families and blacks and Hispanics might be able to move up the income ladder, reducing the spread, or the

weight, at the bottom of the distribution. Birdsall, Ross, and Sabot (1995) describe several mechanisms, "virtuous circles," by which policies that advance development and growth also reduce inequality by improving the economic prospects of a nation's poorest families.[40] Such arguments give a central role to education.

Education is probably the most important lever for enhancing growth and reducing inequality. While the coefficients estimated here, taken at face value, indicate that additions to a region's pool of college-educated workers are associated with increased inequality, they must be interpreted as reflecting faster growth in the demand for college-educated workers than in the supply in regions (years) with a more educated population. The policy goal, if any, must thus be to alter the relationship,[41] not to stanch the spread of higher education. The educational wage premium would decline as a result of changes in either the supply or demand for labor at various educational levels: If the supply of college-educated labor grew faster than the demand, the premium would fall. Increasing access to, and raising the quality of, elementary and secondary education in the United States would give more people the preparation needed for success in college and would also increase the quality of the non-college-educated work force. By the same token, training or schooling to provide job skills to the least prepared individuals and higher-quality high school educations could slow the rise in demand for college graduates by offering employers productive substitutes without the college credential. The payoff in terms of reduced inequality is likely to be large to any efforts that increase the employability and productivity of those currently at the bottom of the income distribution.

[40] The "circle" is completed by a second stage of the process, not examined here, through which the improvements in inequality in turn provide the means, both economic and political, for further investments (notably in increasing access to and the quality of education) that enhance growth. Albelda and Tilly (1995) point out a positive relationship between low inequality and gains in labor productivity.

[42] That is, to change the coefficient, as indeed it changed in the opposite, inequality-augmenting direction in the 1980s.

Appendix A

Measures of Family Income Inequality

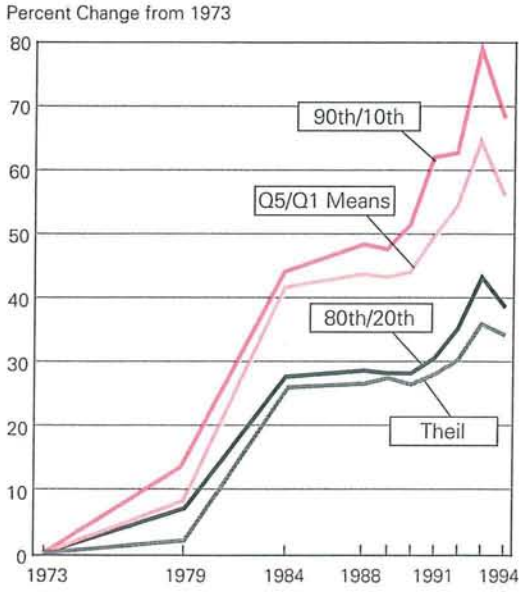
The analysis reported in this paper uses the ratio of income of the 90th percentile family to the income of the 10th percentile family to summarize the degree of family income inequality in a particular year or region. The major advantage of this measure is its simplicity; it is extremely easy to understand what differences in this ratio mean. In addition, the ratio is invariant to multiplicative transformations, an important characteristic when comparing inequality over time or across regions, when (where) levels of income may differ considerably.

Figure A compares the 90th/10th percentile income ratio for the United States with several other measures used in the literature—the ratio of average income in the richest quintile to average income in the poorest quintile, the 80th/20th percentile income ratio, and Theil's measure of income inequality. The chart shows the measures, indexed to their 1973 values, for 1973, 1979, 1984, and annually 1988 through 1994. All four measures move in tandem over the period—rising more steeply from 1979 to 1984 than from 1973 to 1979, leveling out in the 1984–89 period, and falling in 1994. The exact timing and amplitude of their movements, however, does not coincide, and the measure used in this study—the 90th/10th ratio—rose the most in percentage terms.

Figure A

Measures of Family Income Inequality

Selected Years



Source: Author's calculations based on U.S. Bureau of the Census, *Current Population Survey*, March 1974, March 1980, March 1985, March 1989 through March 1995.

Theil's measure, based on information theory, is preferred by many analysts on conceptual grounds. It reflects the shape of the entire income distribution (unlike the 90th/10th ratio or any measure based on only two points in the distribution) although it is more sensitive to income differences at the low end of the distribution. Theil's index also has useful decomposition properties. But it is much more complicated to calculate and to understand than the 90th/10th ratio.

The interpretation of the ratio of average incomes in the richest and poorest quintiles is just as uncomplicated as the 90th/10th ratio. Indeed, the 90th and 10th percentiles are the median incomes within the richest and poorest quintiles. Thus, the discussion that follows points out the relative disadvantages of using quintile means rather than quintile medians to reflect the typical well-being of families in each quintile. A major drawback of the ratio of richest to poorest quintile income averages is that averages are skewed by outliers, which the 90th and 10th percentiles (quintile medians) are not. In the poorest quintile, the average income can be pulled down substantially by negative incomes, but the 10th percentile income is positive in all cases. At the top, a few very high-income families can skew the highest quintile's average income.

Furthermore, income data in the U.S. Current Population Survey are top-coded: Income values above a specific amount (the top code) are reported as equal to the top code. Top-coding obviously biases downward the average income in the richest quintile.[42] But since top-coding affects only the richest 1 to 5 percent of families, the 90th percentile income is not affected.

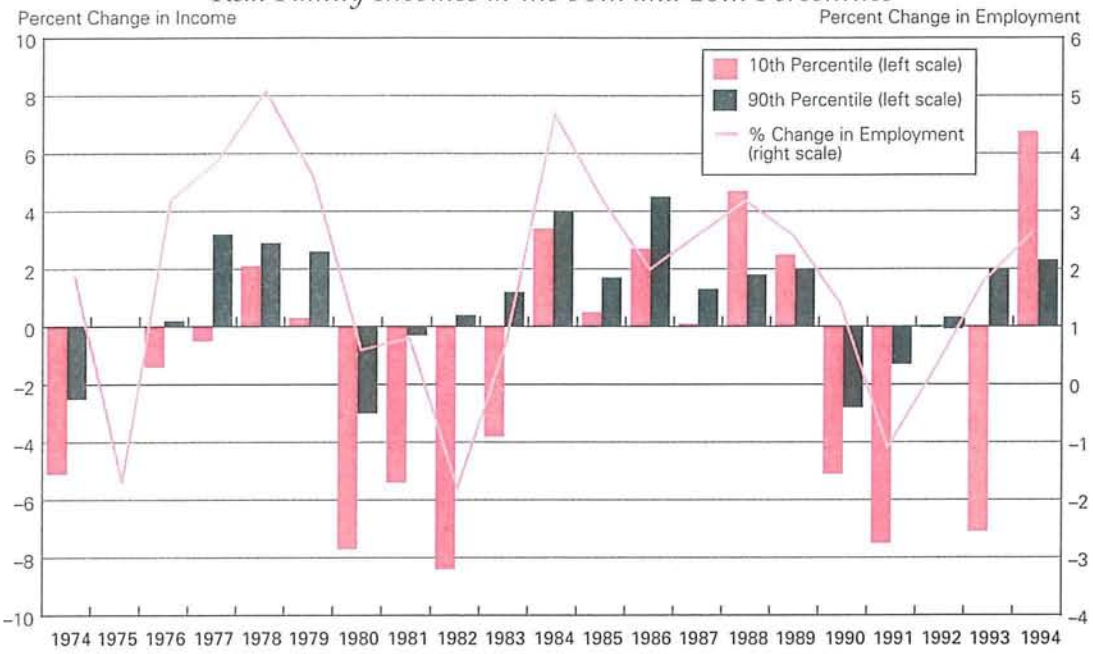
The ratio of income of the 80th percentile family to income of the 20th percentile family is, by definition, less sensitive to changes in the lowest and highest one-fifth of the distribution than the 90th/10th ratio. The choice between the two therefore comes down to choosing a balance between over-sensitivity to outliers (which one would probably see in the 95th/5th ratio) and capturing changes in the relative positions of "poor" and "rich" families.

The regressions reported in Tables 7 and 9 provide another means of comparison between the 90th/10th ratio and two of the alternatives—the 80th/20th and the richest/poorest quintile averages. Columns (2) and (3) of Table 9 report equations specified to be identical to that in Column (1) of Table 7, except the dependent variables in Table 9 are the alternative measures of inequality. The general coefficient patterns are very similar in the equations. The alternative measures of inequality, however, are less strongly related to employment growth, part-time work, and work patterns in one-head families than is the 90th/10th ratio. This finding may reflect these factors' strong effects on the bottom of the income distribution and the greater sensitivity of the 90th/10th ratio to differences in income at the bottom.

[42] Despite this downward bias, the ratio of richest to poorest quintile income averages is greater than the ratio of richest to poorest quintile medians (90th/10th). This occurs because outliers raise the ratio of averages (pulling the average income in the top quintile up and the bottom quintile's average down) more than top-coding reduces it (pulling the top-quintile average down).

Figure B

Year-to-Year Changes in Total Employment and in Real Family Incomes at the 90th and 10th Percentiles



Note: Income data not available for 1975; 1976 bars show 1974-76 change at annual rate. Constant-dollar income calculated using U.S. CPI-U-X1.
Source: Author's calculations based on U.S. Bureau of Labor Statistics, *Employment and Earnings*, and U.S. Bureau of the Census, *Current Population Survey*, March 1974 through March 1995.

Appendix B

Year-by-Year Changes in the Incomes of Rich and Poor Families

Figure B shows year-to-year changes in total employment along with income changes for families at the 10th and 90th percentiles. In all the recession years (1974–76, 1980–82, and 1990–91), real incomes declined at the bottom of the distribution, but in some of those years incomes rose at the top. In non-recession years, real incomes at the top always increased, while those at the bottom sometimes fell. Out of two decades of annual income changes, in only three years—1988, 1989, and 1994—did the incomes of poor Americans grow faster than the incomes of the rich.

Appendix C

1979 Data for Income Characteristics by Type of Family and Family Work Characteristics by Income Quintile

Figure C reports 1979 characteristics by family type corresponding to the 1994 data shown in text Figure 4. Table C decomposes the 1979 disparities in average family earnings among the quintiles into differences in average numbers of workers, annual work hours per worker, and earnings per hour, as did text Table 4 for 1994.

Table C

Family Work Characteristics by Income Quintile, 1979

Family Income Quintile	Average Annual Family Earnings	Average Number of Family Workers	Average Annual Hours per Worker	Average Earnings per Hour
Poorest	$ 8,450	1.1	1,380	$ 5.56
Second	24,500	1.6	1,650	9.03
Middle	37,650	1.9	1,720	11.78
Fourth	50,950	2.1	1,750	13.96
Richest	80,000	2.4	1,760	18.61
All	$40,300	1.8	1,680	$13.10
Ratio: Highest to Lowest	9.5	2.2	1.3	3.3

Note: Average annual family earnings rounded to nearest $50; average hours rounded to nearest 10.
Source: Author's calculations from U.S. Bureau of the Census, *Current Population Survey*, March 1980.

Figure C

Income Characteristics by Type of Family, 1979

All families with nonelderly head

Key

- Number in thousands (share (%) of all) — 50,907 (100.0)
- % in lowest income quintile~highest — 20 ~ 20
- Average # of members, # of workers — 3.4, 1.8
- Percent with children — 63
- Average annual family work hours — 3,100
- Average family income ($) — 45,100

Married-couple families

41,707 (81.9)
13 ~ 23
3.5, 1.9
61
3,300
49,500

Husband and wife work

25,675 (61.6)[a]
8 ~ 27
3.5, 2.4
61
4,000
53,200

Husband or wife works

14,612 (35.0)[a]
18 ~19
3.7, 1.4
64
2,500
45,500

Neither husband nor wife works

Other adult works	No adult works
274 (.7)[a]	1,146 (2.7)[a]
27 ~ 8	68 ~ 4
4.3, 1.3	2.8, 0
52	27
1,600	0
35,500	21,100

One-head families

9,200 . 8.0)
53 ~ 5
3.1, 1.3
74
1,900
25,100

Head works

6,857 (74.5)[b]
43 ~ 6
2.9, 1.6
73
2,400
29,000

Head does not work

Other adult works	No adult works
726 (7.9)[b]	1,617 (17.6)[b]
58 ~ 4	94 ~ 0
3.8, 1.4	3.3, 0
61	87
1,600	0
24,600	8,800

Note: hours and income rounded to nearest 100; demographic characteristics as of March 1980.

[a]Percent of married-couple families.
[b]Percent of one-head families.

Source: Author's calculations based on U.S. Census Bureau, *Current Population Survey*, March 1960.

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Correction

Correction, May/June 1996 *New England Economic Review*

In the article "Technology and Skill Requirements: Implications for Establishment Wage Structures," by Peter Cappelli, incorrect summary statistics were given for Tables 2, 3, and 4. The correct figures are as follows:

Table 2, on page 149: $R^2 = .47$, $\overline{R^2} = .45$, $F = 20.849$

Table 3, on page 149: $R^2 = .40$, $\overline{R^2} = .38$, $F = 16.001$

Table 4, on page 150: $R^2 = .12$, $\overline{R^2} = .08$, $F = 3.12$

Please enter these corrections on your copy of the May/June 1996 issue.

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