The Changing Shape of the Nation's Income Distribution

1947-1998

Consumer Income

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Are the rich getting richer and the poor getting poorer?

Historical Census Bureau income statistics can shed some light on this debate. Although the Census Bureau has been measuring income for a half-century, and a large number of factors have been identified as contributing to changes in inequality, the causes are still not entirely understood.

The Current Population Survey (CPS) is a rich source of data on income inequality.

During the past 50 years, the annual demographic supplement to the March CPS has provided researchers with a wealth of data on the income distribution. Since 1947, the Census Bureau has employed a commonly used measure, the Gini coefficient (also known as the index of income concentration),[1] to measure family income inequality. With two exceptions, the Gini coefficient decreased between 1947 and 1968. During this period, the Gini for families indicated a decrease in income inequality of 7.5 (±2.1) percent.[2] Since 1968, however, this trend has reversed. Income inequality for families, measured by the Gini coefficient, increased between 1968 and 1998 (see Figure 1). The net effect over the entire 1947-1998 period is an increase in family income inequality.[3]

[1] The Gini index ranges from 0.0, when all families (households) have equal shares of income, to 1.0, when one family (household) has all the income and the rest none.

[2] Some estimates are followed by a number in parentheses which can be added and subtracted from the estimate to calculate the upper and lower bounds of the 90-percent confidence interval.

[3] Part of the increase from 1992 to 1993 is due to changes in survey methodology; see box: A New Mode of Data Collection. See U.S. Census Bureau, *Measuring 50 Years of Economic Change, Using the March Current Population Survey,* P60-203 for the historical series of family income Gini coefficients.

A New Mode of Data Collection

In 1993, the Census Bureau began using a new method of collecting income data, allowing respondents to report greater income values in the Current Population Survey. A change that may affect only a small number of cases (particularly those at the upper end of the income distribution) can have a considerable effect on inequality measures, like the Gini coefficient and shares of aggregate income, while making little or no change to median income. This had a profound effect on the upper end of the income distribution by recording income levels that had been previously underreported. The impact of this change on measured income inequality was quite large, and we are unable to determine precisely the proportion of the increase in income inequality between 1992 and 1993 that is attributable to this change.[4]

[4] The Census Bureau introduced computer-assisted personal interviewing (CAPI) in January 1994 to the Current Population Survey. The March 1994 supplement permitted households to report up to $1 million in earnings, up from $300,000, and we made parallel increases in the reporting limits for selected other income sources. Both of these changes affected the data. One analysis of the 1993 inequality statistics suggests that the increase in the maximum amounts that could be reported accounts for about 1.8 percentage points, or about one-third, of the 1992-1993 increase of 5.2 percent. The contribution of the change to CAPI to the increase in measured inequality cannot be determined, but may well bring the share of survey methods-related changes in inequality to over one-half of the 5.2 percentage point apparent increase. See Paul Ryscavage, *"A Surge in Growing Income Inequality?,"* Monthly Labor Review, August 1995, pp. 51-61.

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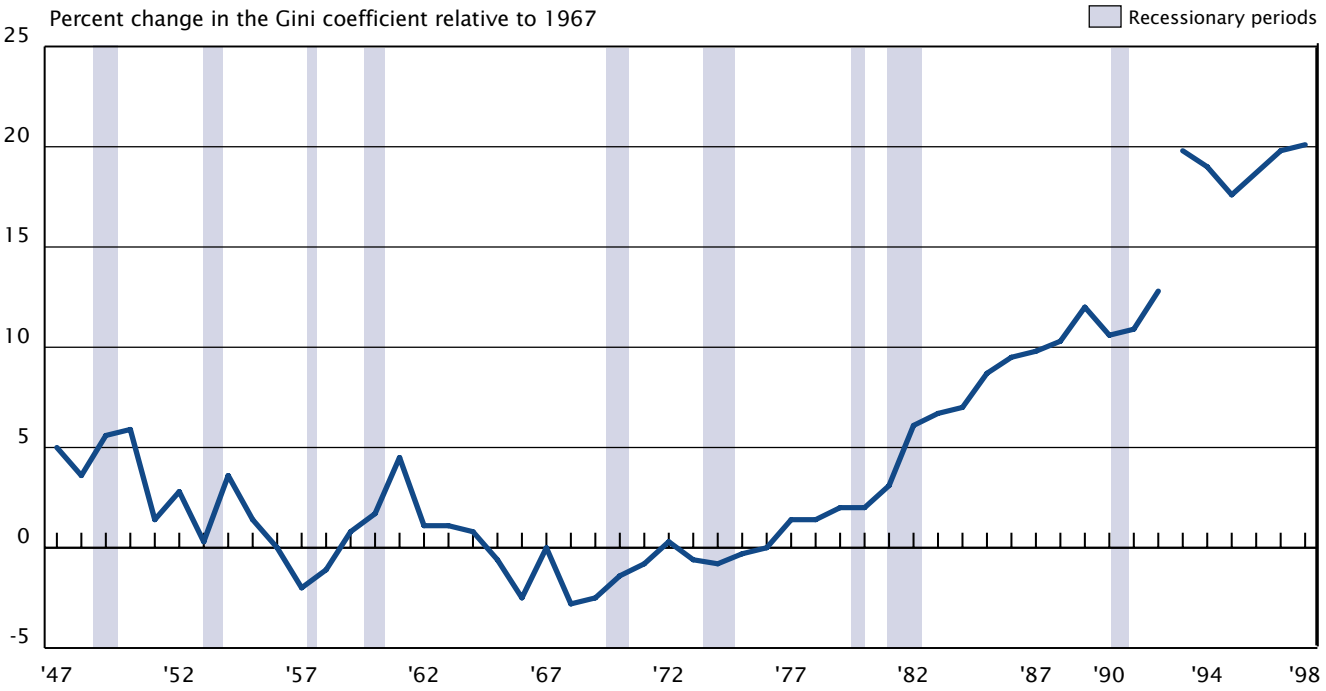
Figure 1.
Change in Income Inequality for Families: 1947-1998



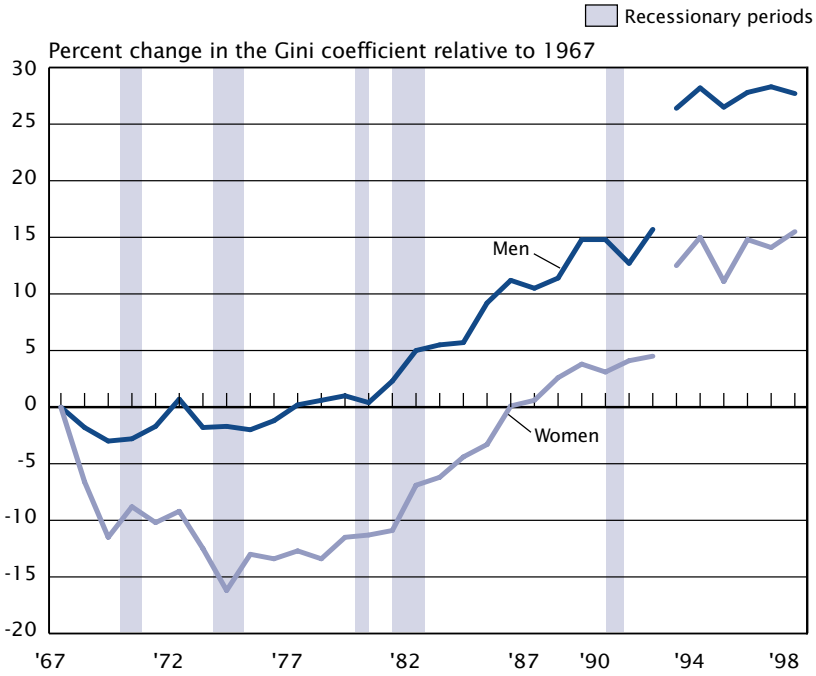
Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1948-1999.

Changes in the earnings distribution have an effect on overall income inequality.

Studying the earnings distribution of people can provide some clues to the underlying causes of overall household income inequality. Earnings, which are an important part of a person's total money income, provide a good indication of how labor markets allocate income to individuals. This is particularly important if changes in income inequality are due to structural changes in the economy, which can translate into differences in wage premiums paid to workers with certain skills.[5]

Figure 2.
Gini Coefficient for Earnings of Men and Women, Full-Time, Year-Round Workers: 1967-1998



Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

[5] Based on the findings of Barry Bluestone, "The Impact of Schooling and Industrial Restructuring on Recent Trends in Wage Inequality in the United States," *American Economic Review,* Papers and Proceedings, May 1990, pp. 303-307, and Kevin Murphy and Finis Welch, "Industrial Change and the Rising Importance of Skill," in Sheldon Danziger and Peter Gottschalk (eds.) *Uneven Tides: Rising Inequality in America,* New York: Russell Sage Foundation, 1993.

Table 1.

Measures of Individual Earnings Inequality for Full-Time, Year-Round Workers for Both Men and Women: 1967-1998

	Gini coefficient			Income ratios, 90/10 and 50/10			
				Men		Women	
	Both sexes combined	Men	Women	90/10	50/10	90/10	50/10
1998	0.393	0.401	0.345	5.31	2.43	4.33	2.08
1997	0.394	0.403	0.341	5.36	2.38	4.46	2.23
1996	0.393	0.401	0.343	5.42	2.46	4.36	2.16
1995	0.388	0.398	0.332	5.31	2.38	4.46	2.23
1994	0.395	0.403	0.343	5.67	2.50	4.50	2.20
1993	0.389	0.397	0.336	5.42	2.50	4.20	2.15
1992	0.360	0.363	0.312	5.12	2.50	4.00	2.10
1991	0.355	0.354	0.311	5.00	2.42	3.94	2.02
1990	0.359	0.361	0.308	5.04	2.42	4.07	2.15
1989	0.362	0.361	0.310	4.87	2.35	4.04	2.08
1988	0.355	0.350	0.306	4.77	2.36	4.14	2.16
1987	0.353	0.347	0.300	4.81	2.40	4.00	2.11
1986	0.355	0.349	0.299	5.00	2.50	3.90	2.08
1985	0.348	0.343	0.289	4.80	2.40	3.74	2.00
1984	0.342	0.332	0.285	4.79	2.45	3.61	2.01
1983	0.340	0.332	0.280	4.67	2.39	3.57	1.97
1982	0.340	0.330	0.278	4.44	2.28	3.34	1.87
1981	0.334	0.321	0.266	4.29	2.29	3.23	1.85
1980	0.331	0.315	0.265	4.38	2.28	3.27	1.83
1979	0.335	0.317	0.264	4.01	2.18	3.18	1.82
1978	0.333	0.316	0.259	4.14	2.21	3.20	1.80
1977	0.332	0.315	0.260	4.12	2.27	3.27	1.87
1976	0.328	0.311	0.259	4.17	2.21	3.11	1.81
1975	0.327	0.308	0.260	3.83	2.04	3.14	1.84
1974	0.326	0.309	0.250	3.84	2.15	3.01	1.78
1973	0.330	0.309	0.261	3.85	2.09	3.38	1.94
1972	0.336	0.316	0.271	4.01	2.16	3.33	1.94
1971	0.328	0.309	0.268	3.93	2.13	3.39	1.94
1970	0.326	0.305	0.272	3.85	2.14	3.41	1.95
1969	0.326	0.305	0.264	3.75	2.06	3.30	1.98
1968	0.333	0.308	0.279	4.01	2.20	3.99	2.30
1967	0.340	0.314	0.298	4.20	2.33	4.67	2.67

Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection). The income ratios represent ratios at the indicated percentiles in the income distribution.

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

Figure 2 depicts how earnings inequality has changed between 1967 and 1998 for both men and women who were full-time, year-round workers, as measured by the Gini coefficient. The earnings distribution for men remained stable, with a few exceptions, between 1967 and 1980. This changed between 1980 and 1989; the Gini coefficient for men's earnings (presented in Table 1) increased from 0.315 to 0.361—a 14.6 (±1.5) percent rise.

Changes in the women's earnings distribution occurred quite differently. Earnings inequality among women who worked full-time, year-round did not increase from 1967 to 1986. In fact, the Gini coefficient indicates that from 1967 to 1980—a period of relative stability for the men's distribution—women's earnings inequality fell by 0.033 (±0.01) points. By 1986, the Gini coefficient for women's earnings had returned to its 1967 level. In 1989, however, the Gini coefficient for women's earnings was 17.0 (±1.9) percent higher than in 1980[6] and 4.0 (±2.3) percent higher than its 1967 level.

Over the 1967-1998 period, earnings inequality for both men and women who were full-time, year-round workers grew consistent with rising income inequality.

[6] The difference in the percentage change in the Gini coefficients for men and women between 1980 and 1989 is not statistically significant.

Households are now the main demographic unit of analysis.

Living conditions have changed considerably in the last 50 years. Today, a smaller percentage of people live in families (two or more people living together who are related by blood, marriage, or adoption) than was the case in the 1940s. As a result, the Census Bureau began collecting and reporting data on the income distribution of households,[7] a more comprehensive unit of analysis, beginning in 1967. Over time, the importance of household data has increased.

A period of rising household income inequality: 1967 to 1992

Changes in data collection methodology between 1992 and 1993 affected the measurement of income inequality. As a result of these changes and an inability to accurately measure their effects, comparisons of income inequality that bridge the years 1992 and 1993 are avoided in the remainder of the report. The timing of this methodological change was convenient; it appears that the growth of household income inequality has slowed post-1992.

Between 1967 (when income data for households first became available) and 1992, the shape of the household income distribution changed dramatically. This 25-year period was one of increasing household income inequality—as evidenced by several measures. These changes, however, took place during a relatively short period.

[7] A household consists of all people who occupy a housing unit. This includes related family members and all unrelated people. The Census Bureau also counts as households people living alone or unrelated people sharing a housing unit as partners. People living in group quarters are excluded.

Table 2.

Household Shares of Aggregate Income by Fifths of the Income Distribution: 1967-1998

Year	Lowest	Second	Middle	Fourth	Highest	Top 5 percent
1998	3.6	9.0	15.0	23.2	49.2	21.4
1997	3.6	8.9	15.0	23.2	49.4	21.7
1996	3.7	9.0	15.1	23.3	49.0	21.4
1995	3.7	9.1	15.2	23.3	48.7	21.0
1994	3.6	8.9	15.0	23.4	49.1	21.2
1993	3.6	9.0	15.1	23.5	48.9	21.0
1992	3.8	9.4	15.8	24.2	46.9	18.6
1991	3.8	9.6	15.9	24.2	46.5	18.1
1990	3.9	9.6	15.9	24.0	46.6	18.6
1989	3.8	9.5	15.8	24.0	46.8	18.9
1988	3.8	9.6	16.0	24.3	46.3	18.3
1987	3.8	9.6	16.1	24.3	46.2	18.2
1986	3.9	9.7	16.2	24.5	45.7	17.5
1985	4.0	9.7	16.3	24.6	45.3	17.0
1984	4.1	9.9	16.4	24.7	44.9	16.5
1983	4.1	10.0	16.5	24.7	44.7	16.4
1982	4.1	10.1	16.6	24.7	44.5	16.2
1981	4.2	10.2	16.8	25.0	43.8	15.6
1980	4.3	10.3	16.9	24.9	43.7	15.8
1979	4.2	10.3	16.9	24.7	44.0	16.4
1978	4.3	10.3	16.9	24.8	43.7	16.2
1977	4.4	10.3	17.0	24.8	43.6	16.1
1976	4.4	10.4	17.1	24.8	43.3	16.0
1975	4.4	10.5	17.1	24.8	43.2	15.9
1974	4.4	10.6	17.1	24.7	43.1	15.9
1973	4.2	10.5	17.1	24.6	43.6	16.6
1972	4.1	10.5	17.1	24.5	43.9	17.0
1971	4.1	10.6	17.3	24.5	43.5	16.7
1970	4.1	10.8	17.4	24.5	43.3	16.6
1969	4.1	10.9	17.5	24.5	43.0	16.6
1968	4.2	11.1	17.5	24.4	42.8	16.6
1967	4.0	10.8	17.3	24.2	43.8	17.5

Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

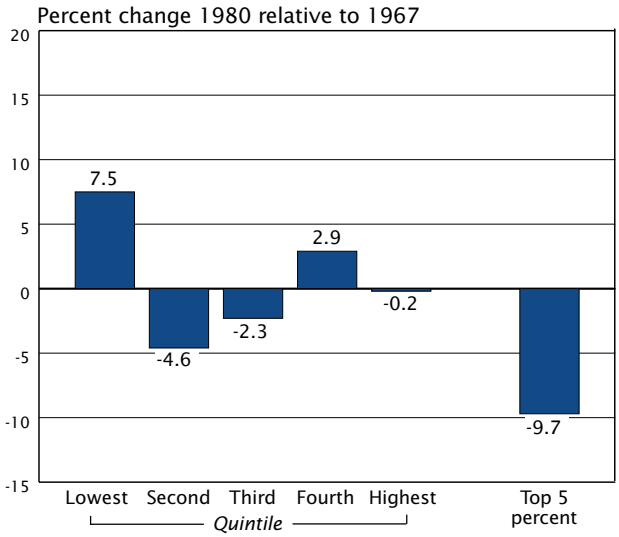
Household income inequality was generally stable between 1967 and 1980.

Measures of income inequality traditionally used to study the income distribution of the United States suggest that the 1967-1980 period was one of relatively stable inequality. The Gini coefficient for households in 1967 stood at 0.399 (±0.01) (see Table 4). In 1980, the Gini coefficient was 0.403 (±0.01), not statistically different from its 1967 level.

Comparing the aggregate shares of household income received by each fifth of the income distribution (presented in Table 2), another common method of examining income inequality, shows growing income *equality* during this period (see Figure 3A). For example, the aggregate share of income held by the households in the lowest fifth grew by 7.5 (±4.3) percent from 1967 to 1980. At the same time, households in the top 5 percent of the distribution experienced a decline in their share of aggregate income from 17.5 (±0.90) percent in 1967 to 15.8 (±0.61) percent in

Figure 3A.

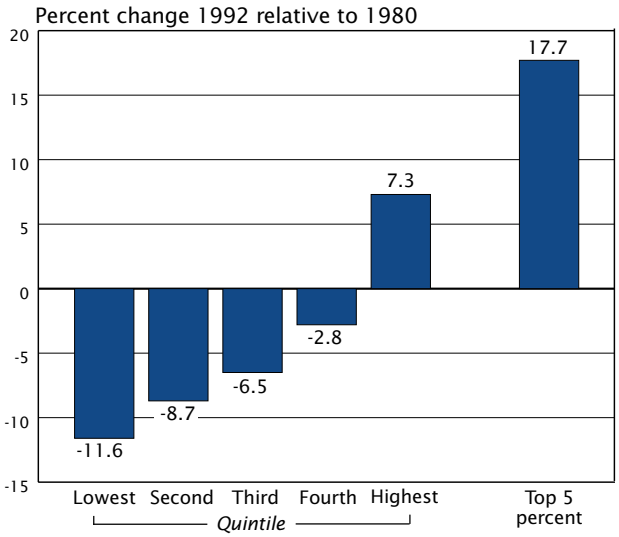
Change in Share of Aggregate Income for Households: 1967-1980



Source: U.S. Census Bureau, Current Population Survey, March 1968 and 1981.

Figure 3B.

Change in Share of Aggregate Income for Households: 1980-1992



Source: U.S. Census Bureau, Current Population Survey, March 1981 and 1993.

Table 3.

Household Income Limits by Percentile: 1967-1998

(Figures in 1998 dollars)

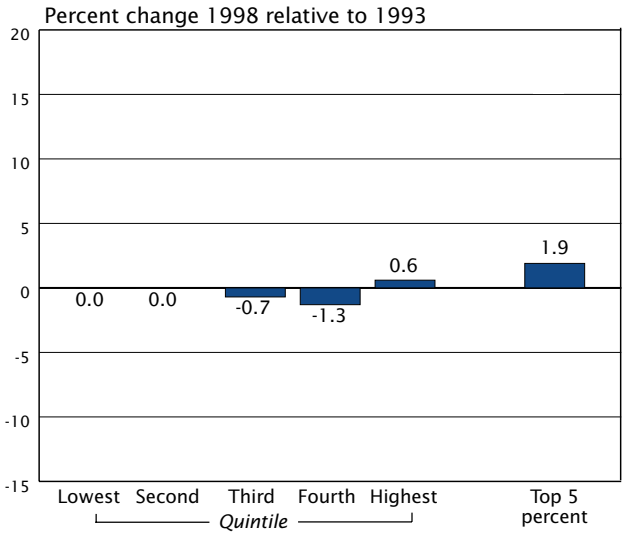
	Income limit by percentile						Ratios of selected percentiles								
Year	P10	P20	P50	P80	P90	P95	P95/20	P95/50	P90/10	P90/50	P80/20	P80/50	P50/10	P10/50	P20/50
1998	9,700	16,116	38,885	75,000	101,300	132,199	8.20	3.40	10.44	2.61	4.65	1.93	4.01	0.25	0.41
1997	9,359	15,640	37,581	72,614	99,183	128,521	8.22	3.42	10.60	2.64	4.64	1.93	4.02	0.25	0.42
1996	9,256	15,342	36,872	70,659	95,629	124,187	8.09	3.37	10.33	2.59	4.61	1.92	3.98	0.25	0.42
1995	9,279	15,402	36,446	69,654	93,799	120,860	7.85	3.32	10.11	2.57	4.52	1.91	3.93	0.25	0.42
1994	8,830	14,767	35,486	69,117	93,360	120,788	8.18	3.40	10.57	2.63	4.68	1.95	4.02	0.25	0.42
1993	8,670	14,627	35,241	68,020	92,206	118,036	8.07	3.35	10.64	2.62	4.65	1.93	4.06	0.25	0.42
1992	8,725	14,639	35,593	67,392	90,620	115,041	7.86	3.23	10.39	2.55	4.60	1.89	4.08	0.25	0.41
1991	8,882	15,065	36,054	67,929	90,814	115,369	7.66	3.20	10.22	2.52	4.51	1.88	4.06	0.25	0.42
1990	9,129	15,589	37,343	68,848	92,412	118,163	7.58	3.16	10.12	2.47	4.42	1.84	4.09	0.24	0.42
1989	9,465	15,900	37,997	70,603	94,585	120,607	7.59	3.17	9.99	2.49	4.44	1.86	4.01	0.25	0.42
1988	9,044	15,683	37,512	69,710	92,316	117,999	7.52	3.15	10.21	2.46	4.44	1.86	4.15	0.24	0.42
1987	8,867	15,496	37,394	69,394	91,006	116,120	7.49	3.11	10.26	2.43	4.48	1.86	4.22	0.24	0.41
1986	8,897	15,405	37,027	68,591	89,754	116,340	7.55	3.14	10.09	2.42	4.45	1.85	4.16	0.24	0.42
1985	8,933	15,149	35,778	66,365	86,587	110,984	7.33	3.10	9.69	2.42	4.38	1.85	4.01	0.25	0.42
1984	8,938	15,061	35,165	65,263	85,391	109,174	7.25	3.10	9.55	2.43	4.33	1.86	3.93	0.25	0.43
1983	8,603	14,729	34,179	63,658	82,670	105,721	7.18	3.09	9.61	2.42	4.32	1.86	3.97	0.25	0.43
1982	8,629	14,527	34,392	62,523	81,846	104,189	7.17	3.03	9.48	2.38	4.30	1.82	3.99	0.25	0.42
1981	8,792	14,762	34,507	62,595	81,057	101,852	6.90	2.95	9.22	2.35	4.24	1.81	3.92	0.25	0.43
1980	8,913	14,965	35,076	62,784	81,005	101,999	6.82	2.91	9.09	2.31	4.20	1.79	3.94	0.25	0.43
1979	9,042	15,439	36,259	64,092	82,687	104,551	6.77	2.88	9.14	2.28	4.15	1.77	4.01	0.25	0.43
1978	9,222	15,416	36,377	63,811	82,104	102,804	6.67	2.83	8.90	2.26	4.14	1.75	3.94	0.25	0.42
1977	9,032	14,992	35,004	62,157	78,947	100,485	6.70	2.87	8.74	2.26	4.15	1.78	3.88	0.26	0.43
1976	8,929	15,035	34,812	60,897	77,658	97,092	6.46	2.79	8.70	2.23	4.05	1.75	3.90	0.26	0.43
1975	8,875	14,574	34,224	59,446	75,699	94,787	6.50	2.77	8.53	2.21	4.08	1.74	3.86	0.26	0.43
1974	9,130	15,461	35,166	61,095	78,293	97,627	6.31	2.78	8.58	2.23	3.95	1.74	3.85	0.26	0.44
1973	9,076	15,257	36,302	62,109	79,428	98,453	6.45	2.71	8.75	2.19	4.07	1.71	4.00	0.25	0.42
1972	8,660	14,868	35,599	60,574	77,833	97,506	6.56	2.74	8.99	2.19	4.07	1.70	4.11	0.24	0.42
1971	8,124	14,371	34,143	57,485	73,747	91,288	6.35	2.67	9.08	2.16	4.00	1.68	4.20	0.24	0.42
1970	7,996	14,552	34,471	57,863	73,709	91,477	6.29	2.65	9.22	2.14	3.98	1.68	4.31	0.23	0.42
1969	8,175	14,786	34,706	57,505	72,961	90,188	6.10	2.60	8.92	2.10	3.89	1.66	4.25	0.24	0.43
1968	7,973	14,367	33,478	54,858	69,178	85,824	5.97	2.56	8.68	2.07	3.82	1.64	4.20	0.24	0.43
1967	7,324	13,471	32,075	53,170	67,539	85,317	6.33	2.66	9.22	2.11	3.95	1.66	4.38	0.23	0.42

Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

Figure 3C.

Change in Share of Aggregate Income for Households: 1993-1998



Source: U.S. Census Bureau, Current Population Survey, March 1994 and 1999.

1980, a 9.7 (±5.8) percent decline. From 1967 to 1980, there was no change in the share of aggregate income held by households in the middle 60 percent and the top fifth of the income distribution.

The choice of measurement method does make a difference.

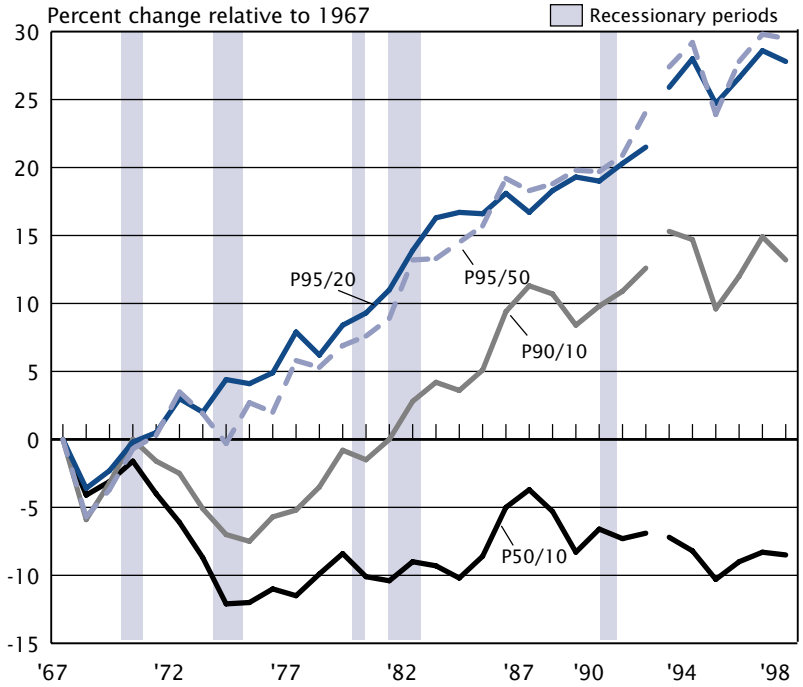
The Gini coefficient and aggregate shares of income indicate that household income inequality was relatively stable and may have decreased between 1967 and 1980. Examination of selected percentiles of the household income distribution tells a different story. Traditionally, the Census Bureau has employed a number of selected percentile limits and ratios to study changes in household income inequality. These include the ratio of income for the household at the 95th percentile to the household at the 20th percentile (95/20); the 95th percentile to the median (95/50); and the 20th percentile to the median (20/50).

In contrast to the shares and Gini measures, these percentile measures (as presented in Table 3) suggest that household income inequality increased from 1967 to 1980. The 95/20 ratio was 6.33 (±0.04) in 1967 and grew to 6.82 (±0.04) by 1980—a 7.7 (±0.76) percent increase. The income of the household at the 95th percentile also increased relative to the median; the 95/50 ratio increased from 2.66 (±0.03) to 2.91 (±0.02).[8] The ratio of the household's income at the 20th percentile to the median was unchanged from 1967 to 1980.

Derivatives of these selected percentiles are also quite prominent in income (and earnings) inequality literature. Some researchers choose to employ alternatives such as the ratio of the 90th percentile to the 10th percentile (90/10) and the median to the 10th percentile (50/10),[9] partly because these measures are less affected by top-coding procedures.

Figure 4 shows that the 95/20 ratio and 95/50 ratio increased from 1967 to 1980, while the 90/10 ratio and 50/10 ratio both declined. Choice of which percentile ratio to use makes a difference. The 90/10 ratio declined slightly from 9.22 (±0.03) to 9.09 (±0.01) during this time. The 50/10 ratio also fell, indicating that the household income at the lowest decile grew relative to the median.

Figure 4.
Percent Change in Percentile Ratios: 1967-1998



Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

Summary measures of inequality can provide additional information about the household income distribution.

Summary measures are a convenient way to examine the distribution of income. They provide a single statistic that summarizes the properties of a given income distribution. Once computed, a summary measure can be used as the focus of research or as a variable in a statistical model. Several of these measures exist; as noted above, one of the most popular is the Gini coefficient. Another popular measure is the mean logarithmic deviation of income (MLD).[10] Like the Gini, the MLD indicates that household income inequality did not increase from 1967 to 1980 (see Figure 5).

The Atkinson measure of income inequality is another summary measure that researchers sometimes use in income inequality research.[11] The Atkinson index is unique relative to other measures of income inequality in that it allows the researcher to specify the social welfare function underlying the research. The social welfare function for most measures of income inequality, including the Gini and MLD, is predetermined by the measure's weighting scheme. The weighting scheme is what determines a measure's sensitivity to changes in different portions of the income distribution. For example, the Gini's weighting scheme is such that it is most sensitive to changes in the middle of the income distribution.

[8] The increase in the 95/20 ratio was not statistically different from the increase in the 95/50 ratio.

[9] Jared Bernstein and Lawrence Mishel, "Has Wage Inequality Stopped Growing?" *Monthly Labor Review,* December 1997, pp. 3-15, is one example.

[10] An additional summary measure of income inequality that is sometimes used in inequality research is the Theil entropy measure, which is based on Henri Theil's *Economics and Information Theory,* Chicago: Rand McNally, 1967. The Theil, like the mean logarithmic deviation of income (MLD), is a generalized entropy measure of income inequality. We examined the Theil entropy measure and found its results to be similar to that of the Gini coefficient and the MLD. Table 4 presents the results of the Theil index's computation, as well as the results using the variance of the natural logarithm of income (VLOG); another measure sometimes used in inequality research. For the sake of brevity, we do not formally analyze the findings from either method in this report.

[11] See Technical Appendix (pages 10-11) for a description of the Gini, MLD, and Atkinson measures of income inequality.

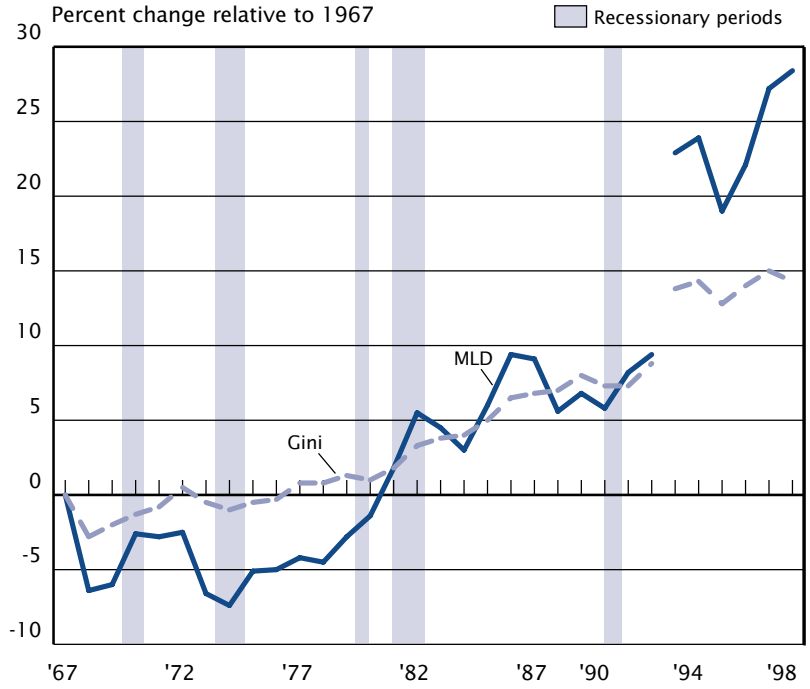
By setting the social welfare function for the Atkinson index, the researcher may choose to emphasize the lower, middle, or upper end of the income distribution. The Atkinson index's social welfare function, which may also be interpreted as the level of inequality aversion, is set by a parameter bounded by the limits of 0 and 1 (see the Technical Appendix). As the parameter approaches its lower limit (i.e., as aversion declines), the Atkinson gives more weight to the upper end of the income distribution. As the parameter approaches its upper limit, the Atkinson measure gives more weight to the lower end of the income distribution.

Figure 6 shows the percentage change for the Atkinson index relative to 1967, calculated at three different levels of inequality aversion (0.25, 0.50, and 0.75). Although each Atkinson index displays a similar inequality growth pattern over time, the results in Table 4 show that the level of observed inequality differs for each calculation. From 1967 to 1980, the Atkinson index computed emphasizing higher incomes ($e = 0.25$) decreased by 2.8 (±2.3) percent. The Atkinson for median ($e = 0.50$) and high ($e = 0.75$) aversion, however, were statistically unchanged from 1967 to 1980.

When did household income inequality increase?

Whereas the data on household income inequality between 1967 and 1980 are ambiguous, it is clear that the household income distribution became increasingly unequal beginning in 1981. Although between 1980 and 1981 the only summary measures to increase significantly were the Atkinson ($e = 0.75$) and the MLD, these changes signified the beginning of a period marked by rising household income inequality.

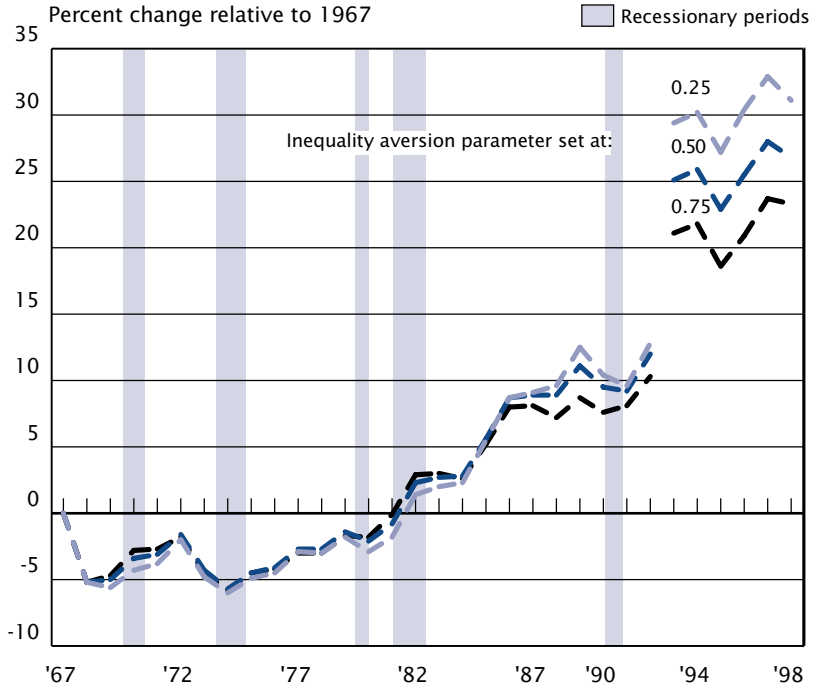
Figure 5.
Summary Measures of Household Income Inequality—Gini and Mean Logarithmic Deviation: 1967-1998



Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U .S. Census Bureau, Current Population Survey, March 1968-1999.

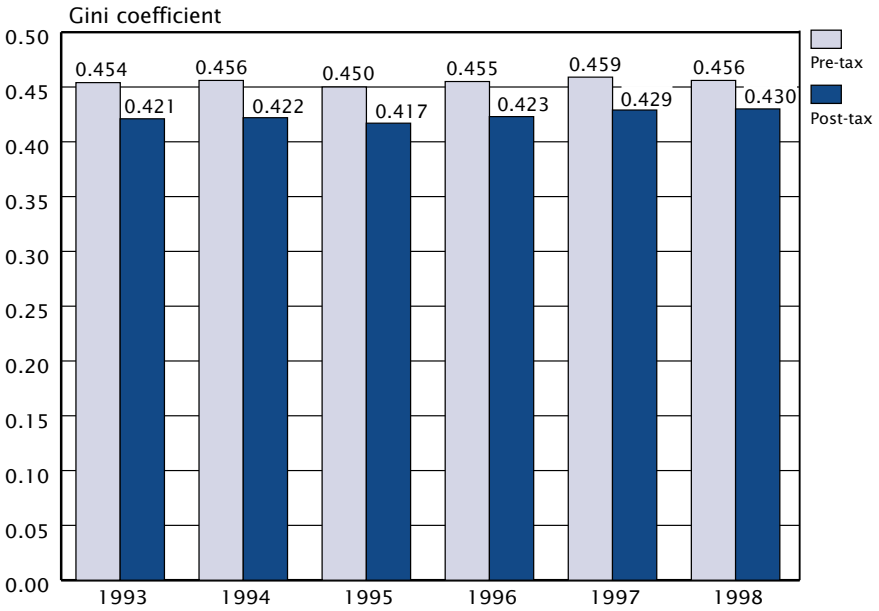
Figure 6.
Atkinson Measures of Income Inequality for Households: 1967-1998



Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

Figure 7.
Gini Coefficients for Pre-tax and Post-tax Household Income: 1993-1998



Source: U.S. Census Bureau, Current Population Survey, March 1994-1999.

The 1980s have been widely characterized as a period of rising income inequality. While true, some of the measures presented here suggest that the rise in inequality started earlier—in the mid-1970s. While the Gini coefficient was unchanged from 1973 to 1980, the MLD index showed substantial growth—it rose 5.6 (±2.5) percent between those 2 years. From 1980 to 1986, both the MLD and Gini measured an increase in income inequality. The Gini coefficient rose 5.5 (±1.9) percent and the MLD increased by 10.9 (±2.5) percent during the same period. The Gini coefficient also increased from 1986 to 1992.

Overall, the period between 1973 and 1992 was one in which income inequality grew, with the cumulative rise in the Gini coefficient at 9.3 (±1.2) percent. The MLD grew a total of 17.2 (±2.6) percent over the same period.

The aggregate shares approach also indicates growing household income inequality from 1980 to 1992. Figure 3B illustrates the net percentage change in the aggregate share of household income received by each fifth of the income distribution. As this illustration shows, households in the top fifth of the distribution (particularly those in the top 5 percent) increased their share of aggregate income, while those in the bottom four-fifths lost ground. Households in the top fifth of the distribution increased their share of aggregate income by 7.3 (±3.1) percent from 1980 to 1992. During the same period, households in the lowest two-fifths experienced a sharp decline in their share of aggregate income. The bottom fifth's share of aggregate income declined by 11.6 (±2.8) percent. Households in the second fifth lost 8.7 (±2.6) percent of their share of aggregate income, not significantly different from the loss experienced by the bottom fifth. These changes highlight the growing gap between the country's richest and poorest households.[12]

Figure 4 also depicts growing household income inequality during the 1980s. The 90/10 ratio increased by 9.9 (±2.9) percent from 1980 to 1989. This indicates that the gap between the richest and poorest households in the United States had increased. The 50/10 ratio increased by 1.8 (±0.85) percent over the same period, which indicates growing inequality in the bottom half of the income distribution. The differential growth rates between the 90/10 and 50/10 ratios also suggest that the spread between the top and bottom deciles increased more than the spread between the middle and bottom deciles. In addition, the 90/50 ratio indicates that there was an increase in the gap between the household at the median and the household at the top decile of 7.8 (±3.7) percent from 1980 to 1989.[13]

What has happened to the income distribution since 1993?

Data collected since 1993 indicate that the trend of increasing income inequality, which characterized the 1980s, has slowed or disappeared. The share of aggregate money income received by households in the top quintile has not experienced a significant increase since 1993. Households in each of the lower quintiles (i.e., those below the top quintile) had roughly the same share of aggregate income in 1998 as in 1993.

Since 1993, the Gini coefficient has not experienced a single statistically significant year-to-year increase. Nor

[12] Between 1980 and 1992, those households in the middle 60 percent of the income distribution experienced a 5.2 percent decline in their aggregate share of household income.

[13] There is not a significant difference between the growth rate in the 90/10 ratio and the 90/50 ratio.

Table 4.
Measures of Household Income Inequality: 1967-1998[a]

Year	Gini	Variance of the log of income	Mean logarithmic deviation of income	Theil	Atkinson $e = 0.25$	Atkinson $e = 0.50$	Atkinson $e = 0.75$
1998	0.456	0.973	0.488	0.389	0.093	0.181	0.271
1997	0.459	0.966	0.484	0.396	0.094	0.183	0.272
1996	0.455	0.954	0.464	0.389	0.093	0.179	0.266
1995	0.450	0.945	0.452	0.378	0.090	0.175	0.261
1994	0.456	0.976	0.471	0.387	0.092	0.180	0.268
1993	0.454	0.942	0.467	0.385	0.092	0.178	0.266
1992	0.434	0.925	0.416	0.323	0.080	0.160	0.242
1991	0.428	0.878	0.411	0.313	0.078	0.156	0.237
1990	0.428	0.888	0.402	0.317	0.078	0.156	0.236
1989	0.431	0.887	0.406	0.324	0.080	0.158	0.239
1988	0.427	0.899	0.401	0.314	0.078	0.155	0.236
1987	0.426	0.936	0.414	0.311	0.077	0.155	0.238
1986	0.425	0.888	0.416	0.310	0.077	0.155	0.237
1985	0.419	0.863	0.403	0.300	0.075	0.151	0.231
1984	0.415	0.859	0.391	0.290	0.073	0.147	0.225
1983	0.414	0.865	0.397	0.288	0.072	0.147	0.226
1982	0.412	0.864	0.401	0.287	0.072	0.146	0.226
1981	0.406	0.826	0.387	0.277	0.070	0.141	0.220
1980	0.403	0.792	0.375	0.274	0.069	0.140	0.216
1979	0.404	0.816	0.369	0.279	0.070	0.141	0.216
1978	0.402	0.784	0.363	0.275	0.069	0.139	0.213
1977	0.402	0.768	0.364	0.276	0.069	0.139	0.213
1976	0.398	0.756	0.361	0.271	0.068	0.137	0.211
1975	0.397	0.746	0.361	0.270	0.067	0.136	0.210
1974	0.395	0.740	0.352	0.267	0.067	0.134	0.207
1973	0.397	0.776	0.355	0.270	0.068	0.136	0.210
1972	0.401	0.790	0.370	0.279	0.070	0.140	0.216
1971	0.396	0.782	0.370	0.273	0.068	0.138	0.214
1970	0.394	0.805	0.370	0.271	0.068	0.138	0.214
1969	0.391	0.774	0.357	0.268	0.067	0.135	0.209
1968	0.388	0.779	0.356	0.273	0.067	0.135	0.208
1967	0.399	0.813	0.380	0.287	0.071	0.143	0.220

Note: Change in data collection methodology suggests pre-1993 and post-1992 estimates are not comparable (see A New Mode of Data Collection).

[a] See Technical Appendix for explanations of the various summary measures and Atkinson inequality aversion parameter (e).

Source: U.S. Census Bureau, Current Population Survey, March 1968-1999.

was the change in the Gini coefficient over the entire 1993-1998 period statistically significant. As Figure 3C shows, there was no change in the aggregate shares either. Only one measure, the MLD, suggests that household income inequality has increased since 1993. The MLD indicates that income inequality grew by 4.5 (±2.2) percent from 1993 to 1998.

How do taxes affect income inequality?

The Census Bureau bases official estimates of money income from the March CPS on gross, or pre-tax, income. The Census Bureau does produce a number of experimental definitions of income to help researchers better understand the economic status of households in the United States.[14] Among the experimental measures of income is post-tax household income. The Census Bureau defines post-tax household income as total household cash income (including realized capital gains), less taxes. We compute post-tax household income both with and without the addition of the earned income tax credit (EITC).

The ability to measure household income inequality both pre-tax and post-tax has important public policy implications. First, it allows researchers to examine how, if at all, taxes affect the distribution of household income. Second, it can provide insight as to whether or not tax changes, such as a change in the EITC, affect observed household income inequality. To measure differences in the pre-tax and post-tax income distribution, we computed Gini coefficients on total pre-tax and post-tax household income.

Figure 7 displays Gini coefficients for both pre-tax and post-tax income for the 1993-1998 period. Not surprisingly, the results show that post-tax household income is distributed more equally than pre-tax household income. In 1998, the post-tax Gini coefficient for households was 0.430 (±0.01), compared with 0.456 (±0.01) for total pre-tax household income. This difference notwithstanding, the Gini indexes

[14] P60-200 contains a technical discussion of how the 15 experimental measures of income are constructed. See U.S. Census Bureau, Current Population Reports, P60-200, *Money Income in the United States: 1997 (With Separate Data on Valuation of Noncash Benefits),* U.S. Government Printing Office, Washington, DC, 1998.

calculated on the post-tax household distribution have not experienced a statistically significant year-to-year change since 1993.

What drives changes in income inequality?[15]

Researchers have tied the long-run increase in income inequality to changes in the U.S. labor market and household composition. More highly-skilled, trained, and educated workers at the top are experiencing real wage gains, while those at the bottom are experiencing real wage losses making the wage distribution considerably more unequal. Changes in the labor market in the 1980s included a shift from goods-producing industries (that had disproportionately provided high-wage opportunities for low-skilled workers) to technical service industries (that disproportionately employ college graduates) and low-wage industries, such as retail trade.

But within-industry shifts in labor demand away from less-educated workers are, perhaps, a more important explanation of eroding wages than the shift out of manufacturing. Other factors related to the downward trend in wages of less-educated workers include intensifying global competition and immigration, the decline of the proportion of workers belonging to unions, the decline in the real value of the minimum wage, the increasing need for computer skills, and the increasing use of temporary workers.

At the same time, changes in living arrangements have occurred that tend to exacerbate differences in household incomes. For example, increases in divorces and separations, increases in births out of wedlock, and the increasing age at first marriage may have all led to a shift away from traditionally higher-income married-couple households and toward typically lower-income single-parent and nonfamily households. Also, the increasing tendency for men with higher-than-average earnings to marry women with higher-than-average earnings may have contributed to widening the gap between high-income and low-income households.

Whether the trend toward increasing income inequality the country has seen in the 1970s and 1980s will continue, or whether it has stopped or even reversed itself, remains to be seen.

Accuracy of Estimates

Statistics from surveys are subject to sampling and nonsampling error. All comparisons presented in this report have taken sampling error into account and meet the Census Bureau's standards for statistical significance. Nonsampling errors in surveys may be attributed to a variety of sources, such as how the survey was designed, how respondents interpret questions, how able and willing respondents are to provide correct answers, and how accurately the answers are coded and classified. The Census Bureau employs quality control procedures throughout the production process—including the overall design of surveys, the wording of questions, review of the work of interviewers and coders, and statistical review of reports.

The Current Population Survey employs ratio estimation, whereby sample estimates are adjusted to independent estimates of the national population by age, race, sex, and Hispanic origin.[16] This weighting partially corrects for bias due to undercoverage, but how it affects different variables in the survey is not precisely known. Moreover, biases may also be present when people who are missed in the survey differ from those interviewed in ways other than the categories used in weighting (age, race, sex, and Hispanic origin). All of these considerations affect comparisons across different surveys or data sources.

Contact Martha Jones, Demographic Statistical Methods Division, dsmd_s&a@ccmail.census.gov for the information on the source of the data, the accuracy of the estimates, the use of standard errors, and the computation of standard errors.

Comments From Data Users

The Census Bureau welcomes the comments and advice of data users. If you have suggestions or comments, please write to:

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Technical Appendix

This technical appendix contains an explanation of the calculations of the income inequality measures used herein.

[15] This section is based on Paul Ryscavage and Peter Henle, "Earnings Inequality Accelerates in the 1980s," *Monthly Labor Review,* December 1990; Sheldon Danziger and Peter Gottschalk (eds.) *Uneven Tides: Rising Inequality in America,* New York: Russell Sage Foundation, 1993; Lynn A. Karoly and Gary Burtless, "Demographic Change, Rising Earnings Inequality, and the Distribution of Personal Well-Being, 1959-89," *Demography,* 32, No. 3 (August 1995), pp. 379-405; U.S. Council of Economic Advisors, *Economic Report of the President,* Washington, DC: U.S. Government Printing Office, February 1992, Chapter 4; U.S. Council of Economic Advisors, *Economic Report of the President,* Washington, DC: U.S. Government Printing Office, February 1995, Chapter 5; and U.S. Council of Economic Advisors, *Economic Report of the President,* Washington, DC: U.S. Government Printing Office, February 2000, Chapter 1.

[16] Hispanics may be of any race.

Desired Properties of Summary Measures of Income Inequality

Summary measures of income inequality should possess two important properties: *scale invariance* and *the principle of transfers*. A measure is said to be scale in variant if a constant applied to all incomes in a distribution does not affect the degree of inequality. The principle of transfers, another desired characteristic of inequality measures, dictates that a measure of income inequality rises (falls) when you transfer income from a poorer (richer) person to a richer (poorer) person. The summary measures included in this report are scale invariant and adhere to the principle of transfers.

The Gini Coefficient

The Gini coefficient incorporates detailed shares data into a single statistic, which summarizes the dispersion of income across the entire income distribution. The Gini coefficient ranges from 0, indicating perfect equality (where everyone receives an equal share), to 1, perfect inequality (where only one recipient or group of recipients receives all the income). Although the Gini is based on the difference between the Lorenz curve (the observed cumulative income distribution) and the notion of a perfectly equal income distribution, this approach can be complex to compute. A more computationally convenient equivalent may be used.

$$Gini = \frac{2}{\mu n^2} \sum_{i=1}^{n} iX_i - \frac{n+1}{n}$$

where μ is the population mean, n is the weighted number of observations, and X_i is the weighted income of individual i, which is also weighted by individual i's rank in the income distribution. The functional form is based on the work of Partha Dasgupta, Amartya Sen, and David Starrett, "Notes on the Measurement of Income Inequality," *Journal of Economic Theory* 6 (1973), pp. 180-87.

The Mean Logarithmic Deviation of Income

The mean logarithmic deviation of income (MLD) is a member of the generalized entropy family of income inequality measures. Among the attributes that make the MLD an attractive measure is its ability to measure inequality both within and between groups. In addition, the MLD has one of the most computationally convenient functional forms of all summary measures discussed here.

$$MLD = \frac{1}{n} \sum_{i=1}^{n} log \left(\frac{\mu}{X_i}\right)$$

where X_i is the weighted income of individual i and μ is the mean income of the selected population. See Martin A. Asher and Robert H. DeFina, "The Impact of Changing Union Density on Earnings Inequality: Evidence From the Private and Public Sectors," *Journal of Labor Research,* 18, No. 3, (Summer 1997), pp. 425-437, for an applied look at the MLD's decomposition.

The Atkinson Index

The distinguishing feature of the Atkinson index is its ability to gauge movements in different segments of the income distribution. Researchers can place greater weight on changes in a given portion of the income distribution by setting the e parameter (referred to as the level of "inequality aversion"). The Atkinson index's functional form is:

$$A = 1 - \frac{n}{1}\left[\sum_{i=1}^{n}\left(\frac{X_i}{\mu}\right)^{1-e}\right]^{\frac{1}{1-e}}$$

where X_i is the weighted income of individual i and μ is the mean income of the selected population. The e parameter, which is bound by the limits of 0 and 1, determines the level of inequality aversion. The Atkinson becomes more sensitive to changes at the lower end of the income distribution as e approaches its limit of 1. Conversely, as the level of inequality aversion falls (that is, as e approaches 0) the Atkinson becomes more sensitive to changes in the upper end of the income distribution. Paul D. Allison, "Measures of Inequality," *American Sociological Review,* 43 (December 1978), pp. 865-880, presents a technical discussion of the Atkinson measure's properties.